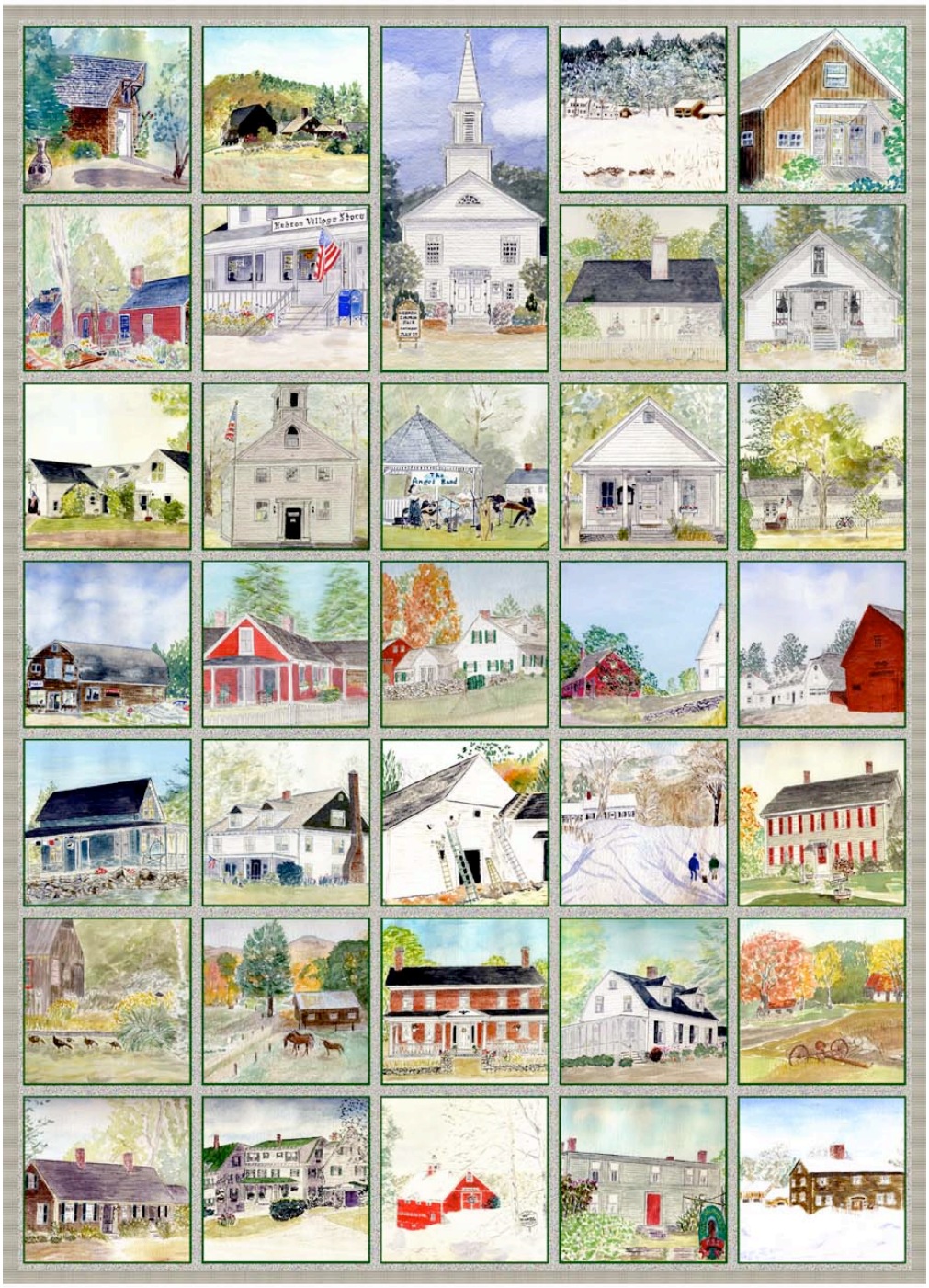
HEBRON MASTER PLAN



Hebron, New Hampshire
2005

HEBRON MASTER PLAN

HEBRON, NEW HAMPSHIRE

2005

The Planning Board of the Town of Hebron, New Hampshire, in accordance with the provisions of **New Hampshire RSA Section 674:2**, hereby adopts the *Hebron Master Plan - 2005*, including its findings, vision statement, and recommendations.

Hebron Planning Board

Chair: _____

Date: July 6, 2005

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TOWN OF HEBRON

MUNICIPAL OFFICIALS

PLANNING BOARD

Roger Larochelle, Chair	Eleanor Lonske, Vice-chair
Curtis Mooney	Richard Cowern, Selectmen's Representative
David Wall	Phillip Twombly, Alternate
Chuck Beno, Alternate	Doug McQuilkin, Alternate

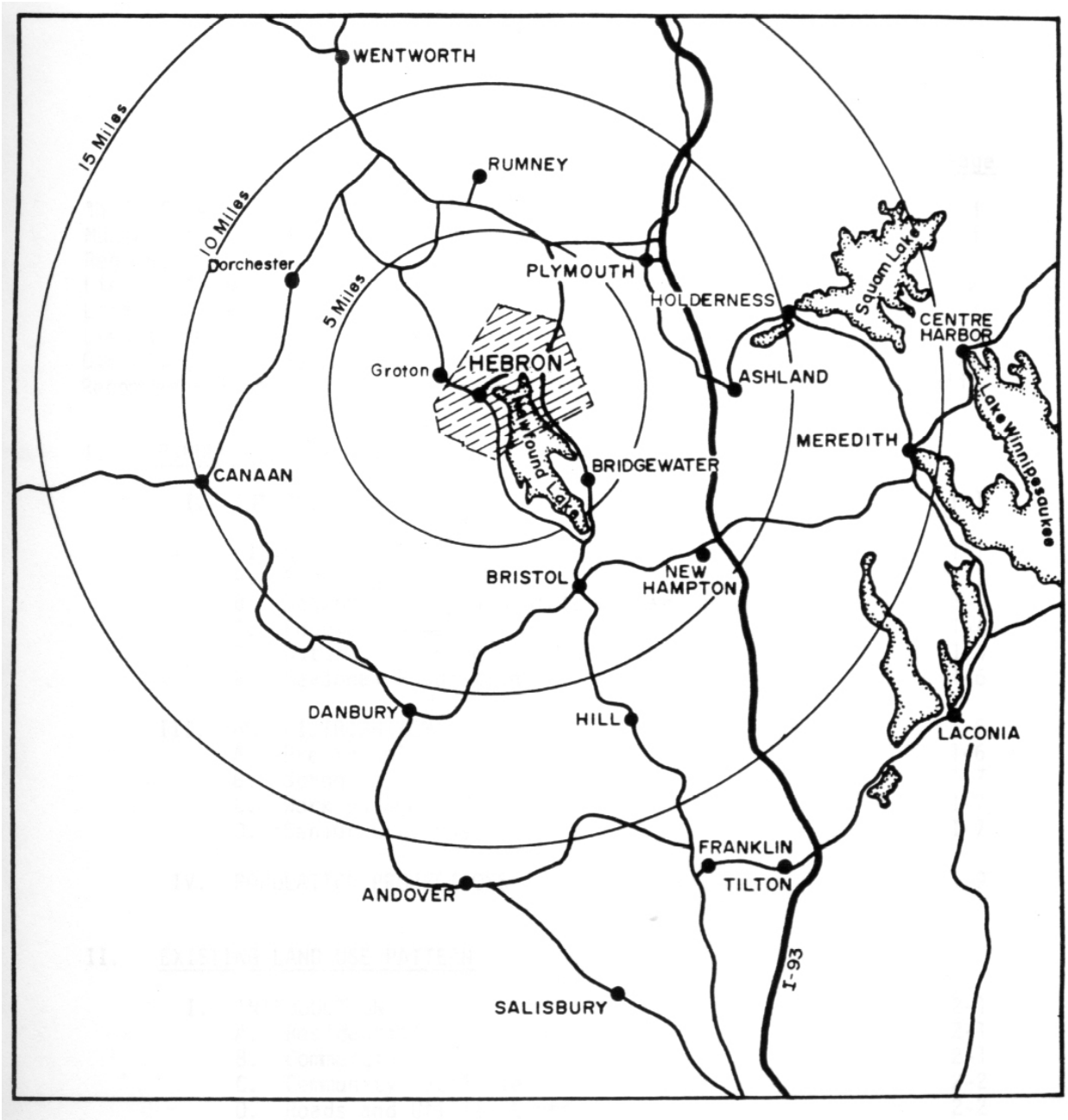
BOARD OF SELECTMEN

John Matthews, Chairman

Ronald Collins

Richard Cowern

TOWN OF HEBRON, REGIONAL LOCATION



A BRIEF HISTORY OF HEBRON

Hebron was formed in 1791 from portions of the former township of Cockermouth and of what was then called West Plymouth. The original township of Cockermouth was granted to 64 proprietors in 1761 but was not sufficiently settled by this original group and was therefore re-granted in 1766. The early settlers, of English stock, came from Hollis and Bow, New Hampshire, and from Massachusetts and Connecticut. Many fought in the French and Indian War and in the American Revolution.

By the early 1780's most of the good farmland along the Cockermouth River and Newfound Lake had been taken, forcing newcomers to the surrounding hills. Unlike the flood-prone lowlands, the highlands were dry and easier to cultivate and enjoyed a longer frost-free growing season. Farm families produced most of their own clothes, tools, furniture, and food, and bartered maple sugar, corn, hay, wood and labor for other necessities. There were some specialists in the village: blacksmiths, millers, sawyers, tanners, basket makers, tailors, glove makers and even a brick maker, but nearly all were also farmers. Most farms raised sheep, the most profitable stock, plus oxen, and (later) cattle. Women were responsible for spinning and weaving cloth, as well as for the salt-tub, the smokehouse, the drying kettle, the candle mold, butter and cheese production and food preservation.. The few diversions from farm labor included: quilting parties, spelling bees, church meetings and barn and house-raising parties.

The population of Hebron in 1800 was 281. The twenty years from 1800 to 1820 saw the people of New England building turnpikes, and the inhabitants of Hebron were not behind the times. In 1803 a charter was granted for the construction of the Mayhew Turnpike to shorten the travel distance between Concord and Haverhill and Connecticut River towns and to facilitate travel from the northern part of the State, for it was one of the direct routes from Montreal to Boston. It was an aid to business in the region, especially to the tavern keepers. Pike's Tavern (later McClure Tavern) opened around 1804 in the house now known as "Six Chimneys". Turnpike traffic and tavern business was brisk until the opening of the Franklin and Bristol railroad in 1848.

The location of the Turnpike influenced the later settlers' choice of lots, with the majority of farms built at this time on Pike Hill, Wade, Favor and Hunt roads near intersections with the Pike. In 1820, the population reached an all-time high of 572. With the advent of railroads, traffic through East Hebron greatly diminished. Except for a brief boom caused by new markets opened by the

Mayhew Turnpike and high wool prices during the War of 1812, life in Hebron remained unchanged until inexpensive fertile lands became available further west and the Great Western Migration began. The California Gold Rush, the Civil War, and the Industrial Revolution also claimed many Hebron residents, as did diseases that sometimes destroyed entire families. As time went by, crumbling barns and cellar holes were all that showed where farmhouses had once stood.

The beginning of the tourist migration to the Newfound Lake area began in the 1870's when regular stagecoach service brought fishermen and hunters and leisure seekers to the Newfound Lake area. Some Hebron farmers capitalized upon the situation as a good means of supplementing their income. Extra bedrooms in a farmhouse, along with old-fashioned home cooking, were an irresistible temptation to many visitors. The tourist boom gave birth to another Hebron institution: private boys' and girls' camps including Pasquaney in 1895, Redcroft (now Onaway) in 1900, Mowglis in 1903, Sycamore (now Berea) in 1916, and WiCoSuTa around 1920. Their greatest impact on Hebron was unintended: large areas of shoreline and many acres of surrounding land have remained forest and woodlands. Further, in several cases, the land is held in perpetual trust, ensuring that it will be preserved.

Skiing was already a favorite local winter sport when the 1922 Winter Carnival on Tenney Hill prompted the creation of private ski clubs in Bristol and Hebron. The Harvard University's ski lodge in Hebron is now the Oedel house on George Road.

The population of Hebron decreased steadily from 1850 to 1950 when it reached an all-time low of 130, but has seen a steady increase from that time to the present. Hebron's low tax rate and rural setting have made the town a vacation home and retirement magnet, with retirees now making up the majority of the full time population.

As we have seen, Hebron has undergone many changes over the last three centuries, and will surely continue to grow and change throughout the 21st century. We hope that, whatever the future may bring, Hebron's rural beauty and small-town friendliness will be preserved.

VISION STATEMENT

In ten years, Hebron will still be a small, friendly, rural community of predominantly single-family homes, many being used as second or vacation dwellings. A steady influx of new homeowners can be expected, with a mix of residents and nonresidents, of retirees and young families. Warm relations will continue between year-round and seasonal residents. Unofficial "town meetings" will be held in the summer to help seasonal residents better understand local matters and be a more integral part of the community. The need for affordable housing for all Hebron residents, including the elderly, will have been addressed.

The townspeople will support the Planning Board in following the recommendations of the Master Plan, especially those concerned with suitability of land for development. Cluster development and conservation of land will be encouraged. Historic home sites and structures will be protected. New developments and renovations of existing structures will be in keeping with the aesthetic nature of the community and compatible with a healthy environment. Noise, light, and water pollution will be regulated.

The natural beauty of Hebron's open space, scenic vistas, and pristine lake will be preserved. Large tracts of conserved land will remain part of the landscape. The Town, private citizens and non-profit organizations such as the New Hampshire Audubon, the Newfound Lake Region Association, and the Society for the Protection of New Hampshire Forests will be encouraged to conserve and own undeveloped land to preserve green space. Agricultural easements will be cultivated.

Undeveloped land will protect wetlands and help preserve the quality of water resources. The Conservation Commission will be charged with enforcing the Shoreland Protection Act, and through education and action will work to prevent erosion of hillsides and pollution of brooks and streams, the River, and the Lake.

Small commercial businesses such as cottage industries, the Hebron Village Store, and the Newfound Marina will continue to be encouraged. Large-scale commercial and industrial development is not appropriate and will be discouraged. Camps have long been a staple of the community and will be fostered, as they provide examples of environmentally conscious stewardship.

Quality academic opportunities for our children will remain paramount. Enhancements to our Town Library will include upgrading the facility, expanding the hours, and providing online computers for community use.

The Town will promote areas for group and individual recreation. These will include, but not be limited to, volleyball courts, picnic tables, and biking, jogging, and walking paths. An environmentally appropriate and safe playground on the Town Common will enhance community events held there. Lands owned by the Town (for example, the Bean sanctuary and the Rogers property), the New Hampshire Audubon Society, hiking trails maintained by the local camps, and the network of snowmobile trails will all provide year-round recreation. The Town Beach will be expanded to provide more beach area and parking.

Roads will be maintained and upgraded, while keeping the scenic and historical character of the Town's rural roads. Road improvements will include shoulders for safer travel and recreation. Speeding will be controlled.

The Historic District provides an important emotional and physical common ground for the community, and will continue to do so in the future. To preserve the uniquely beautiful Town Common, any new or remodeled buildings regulated by the Hebron Historic District Commission will be kept in the tradition of old New England. A watering system on the Common will help sustain healthy trees and shrubs. More parking spaces will be available. A Community Hall, whether a new building or a renovated existing building, will provide space for civic, recreational, and cultural gatherings and needs, and will be handicapped accessible.

The stewardship of Hebron has always included fiscal responsibility to its taxpayers. This will continue.

SUMMARY OF RECOMMENDATIONS[1]

To preserve wetlands, streams and brooks, maintain the water quality of the Newfound Lake watershed, minimize the effect of new development on the Town's natural scenic beauty and its pastoral atmosphere, and be in harmony with zoning ordinances in other Lakes Region communities, we recommend that the Town:

- Support zoning changes that would limit development in areas of steep slopes and in or near wetlands and floodplains.

To ensure adequate and safe housing for all residents, we recommend that the Town:

- Determine the need for affordable housing, including senior housing, and if determined necessary, support zoning changes to ensure the availability of such housing.

- Determine the need for enhanced code enforcement services.

To enhance the Historic District and protect historic resources, we recommend that the Town:

- Explore possible sites and designs for a Community Hall as soon as possible to avoid potential conflicts with other needs (for example, expanded cemetery space).

- Encourage preservation of historic documents, photographs, and artifacts, with public display of selected items.

- Establish a Heritage Commission under the purview of the Historic District Commission. Work with these commissions and local organizations to explore the feasibility and desirability of expanding the Historic District and protecting historic sites outside the District (for example, the Ordway and Ball home sites).

[1] For details on these recommendations, see *Chapter 3 – Land Use*

- Maintain public buildings in the Historic District. Enhance public grounds in the Historic District by replacing diseased trees with drought-tolerant varieties and by installing a watering system.

To maintain the rural quality of the Town so valued by its residents and to minimize the effect of development on the Town's natural scenic beauty and pastoral atmosphere we recommend that the Town:

- Encourage land trusts, conservation groups, and private and municipal landowners to hold forests, shoreline, and open space for conservation and public recreational uses, as appropriate, and promote the use of conservation easements and restrictions for these purposes.

- Create a reserve fund, partially funded by change-of-use penalties, for purchasing conservation land.

- Develop an Open Space Subdivision ordinance that would require developers to retain a significant portion of the development for open space/conservation easements.

- Create a Hebron Town Forest.

- Using the *Comprehensive Shoreland Protection Act* as a guide, develop ordinances to protect the Cockermouth River, the major brooks (e.g. Cilley, Fretts, Wise, Tannery, and Georges/Bog brooks) and wetlands.

- Support sound forestry management practices.

To help maintain Hebron's rural character, to prevent further reduction of visibility of the night sky, and to reduce annoying lighting conditions, we recommend that the Town:

- Adopt a lighting ordinance in conformity with the "Dark Sky" guidelines of the New Hampshire Office of Energy and Planning Technical Bulletin 16.

To address the need for expanded recreational opportunities we recommend that the Town:

- Expand recreational facilities on Town-owned lands.

- Work with land trusts, and with private and municipal landowners to create linking trail networks.

- Work with landowners to explore the possibility of a "river walk" along the Cockermouth River.

- Encourage landowners and organizations to maintain lanes for four-season multi-use trails along Class VI roads.

To improve road safety, we recommend that the Town:

- Work with the New Hampshire Department of Transportation to make improvements on NH 3A, North Shore Road, West Shore Road, and Groton Road to improve vehicular and pedestrian safety.

- Maintain and upgrade town roads in keeping with the scenic and historical character of the Town. Add shoulders for safer travel and recreation.

To strengthen communications, we recommend that the Town:

- Post all public notices and related agendas on the Town of Hebron web site. This would not be a substitute for statutory notice.

- Publish a calendar of events and minutes of public meetings on the Town of Hebron web site.

- Publish notices of events and meetings on the local free cable TV channel.

- Continue its practice of holding a summer informational town meeting to better include nonresidents and part-time residents in the civic life of Hebron.

ACKNOWLEDGMENTS

It may take a village to raise a child, but it took a whole town to write this Master Plan. I would like to acknowledge the hard work and vision of the many people in the Hebron community who contributed to this document through their service on the Board of Selectman, the Planning Board, the Hebron Community Survey Subcommittee and the Hebron Hazards Mitigation Committee. Thanks also to the members of the Focus Groups for transforming dry data into a vision for Hebron for the next ten years. I would like to acknowledge the thoughtful comments and suggestions of the Hebron residents and nonresidents who participated in the Community-wide Open Meeting and who completed the Hebron Master Plan Community Survey. I am also grateful to the staff at the Lakes Region Planning Commission for their invaluable help and counsel.

Finally, thanks to the many people who went over drafts of this document with a fine-tooth comb and exposed so many, many errors. Any errors that avoided scrutiny or crept back in under cover of darkness are proof positive that perfection is ever a journey and never a destination.

Eleanor Lonske, Editor

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Chapter 1

POPULATION CHARACTERISTICS

I. INTRODUCTION

An analysis of trends in a town's changing population is one of the most fundamental aspects of a master planning effort. Any significant changes in the population of a town will consequently affect land use patterns, the town's economic base and local demand for housing, transportation, human services and community facilities. Shifts in the composition of the population are important, since knowledge of changes in the school age, senior citizen and seasonal population is a prerequisite to providing for proper education, senior housing and the timing and tailoring of services in the future.

II. HISTORICAL TRENDS

A. Population Growth

In the year 1800, the population of Hebron was 281. By 1820 the Town's population doubled in size, to an all-time high of 572 persons. Between 1820 and 1850, the population size remained relatively stable, but then went into a steady decline for the next one hundred years. In 1950, Hebron had only 130 residents. Unless noted otherwise, all the figures and tables in this chapter are based on the United States Census.

Figure 1-1 and Table 1-1, (Population Growth – 1800-2000) show that another period of rapid growth began in the 1950's and continues to this day. The population of Hebron increased by about 18 percent between 1950 and 1960, 53 percent from 1960 and 1970, 49 percent from 1970 to 1980, 11 percent from 1980 to 1990, and 19 percent from 1990 to 2000. The Town's population in the 2000 census was 459, an increase of seventy-three residents in ten years or about seven per year. The median age was fifty, the highest of any town in the State.

As shown in Figure 1-2, in the years from 1970 to 2000, the "natural growth" of the Town, i.e. the growth based only on actual birth and death rates, was close to zero. The gap between the growth as shown in the census data and the natural growth shows an influx of over 200 new residents during that thirty-year period

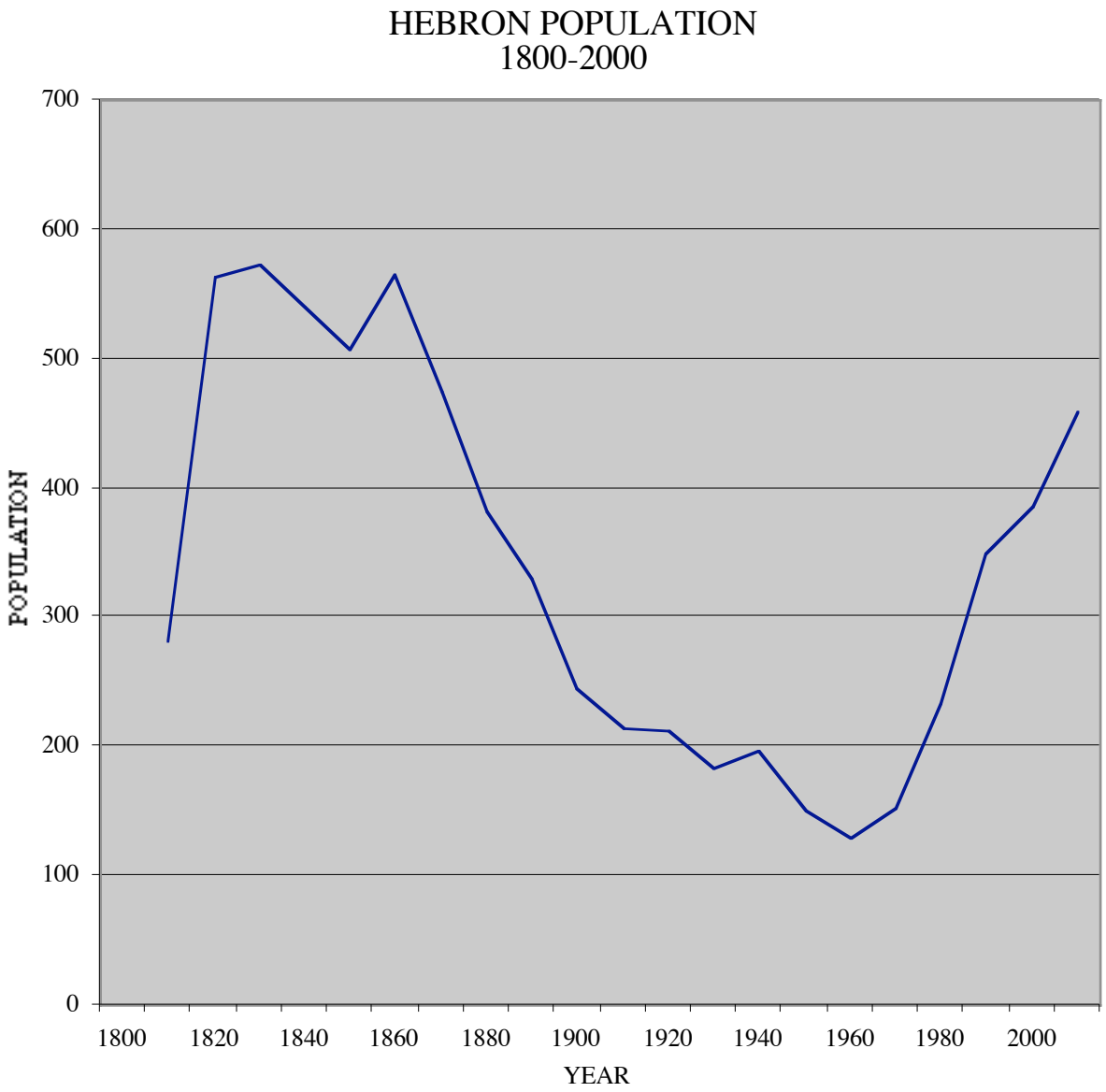

HEBRON POPULATION
1800-2000
700
600
500
400
300
200
100
0
POPULATION
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
YEAR

Figure 1-1

TABLE 1-1

Population Growth – 1800-2000
Hebron, N.H.

Year	Population	Numerical Change	Percent Change
1800	281	---	---
1810	563	+282	100.4
1820	572	+ 9	1.6
1830	540	- 32	-5.6
1840	508	- 32	-5.9
1850	565	+ 57	11.2
1860	475	- 90	-15.9
1870	382	- 93	-19.6
1880	329	- 53	-13.9
1890	245	- 84	-25.5
1900	214	- 31	-12.7
1910	213	- 1	-0.5
1920	184	- 29	-13.6
1930	197	+ 13	7.1
1940	151	- 46	-23.4
1950	130	- 21	-13.9
1960	153	+ 23	17.7
1970	234	+ 81	52.9
1980	349	+115	49.1
1990	386	+ 37	10.6
2000	459	+ 73	18.9

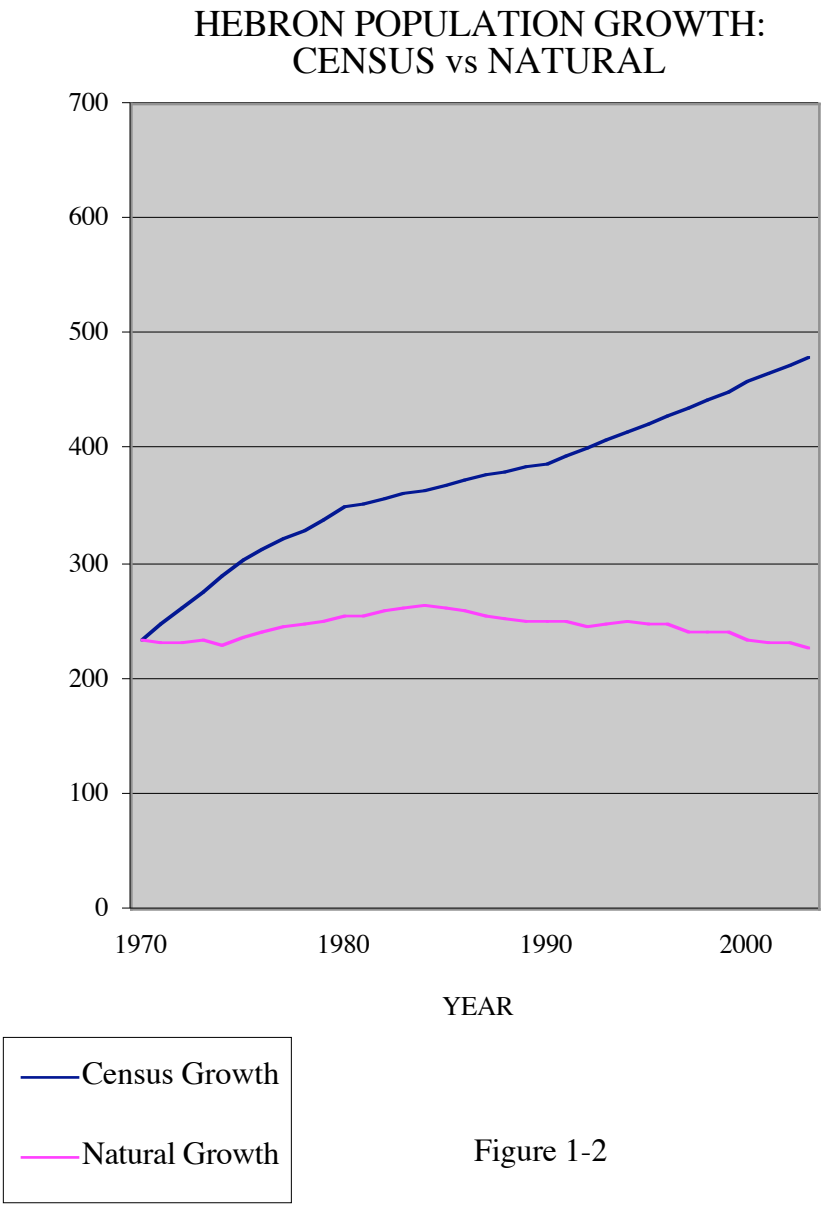

HEBRON POPULATION GROWTH:
CENSUS vs NATURAL
700
600
500
400
300
200
100
0
1970
1980
1990
2000
YEAR
Census Growth
Natural Growth

Figure 1-2

B. Hebron, County and State Comparisons

Figure 1-3 compares the wild swings of Hebron's growth rates in the 20th century with the more sedate growth rates of Grafton County and the state of New Hampshire. It is important to note that because the population of Hebron is so small and because growth rates are calculated in percentages, even an increase or decrease of a few residents will affect the town's growth rate dramatically. Taking this into consideration, if we look at the last four decades (1960-2000), we see that Hebron's growth rate outstripped the county's and the state's in every decade except the years between 1980 and 1990. Between 1990 and 2000, Hebron's growth rate was 19 percent - over twice that of Grafton County.

Another way of comparing the population growth of Hebron with Grafton County and the State of New Hampshire is to look at what percentage of the County's and the State's population lives in Hebron, and how that percentage has changed over the years.

We see from Table 1-2 that the population of Hebron has grown from 0.3% of Grafton County in 1960 to 0.6% in 2000. This is yet another way of saying that the Town has grown at a much faster rate than the County. Note that in the same period the Town's population varied between .03% to .04% of the State's population. This would indicate that in projecting the population growth of the Town, one would be better off looking at projections of State growth rather than Grafton County growth.

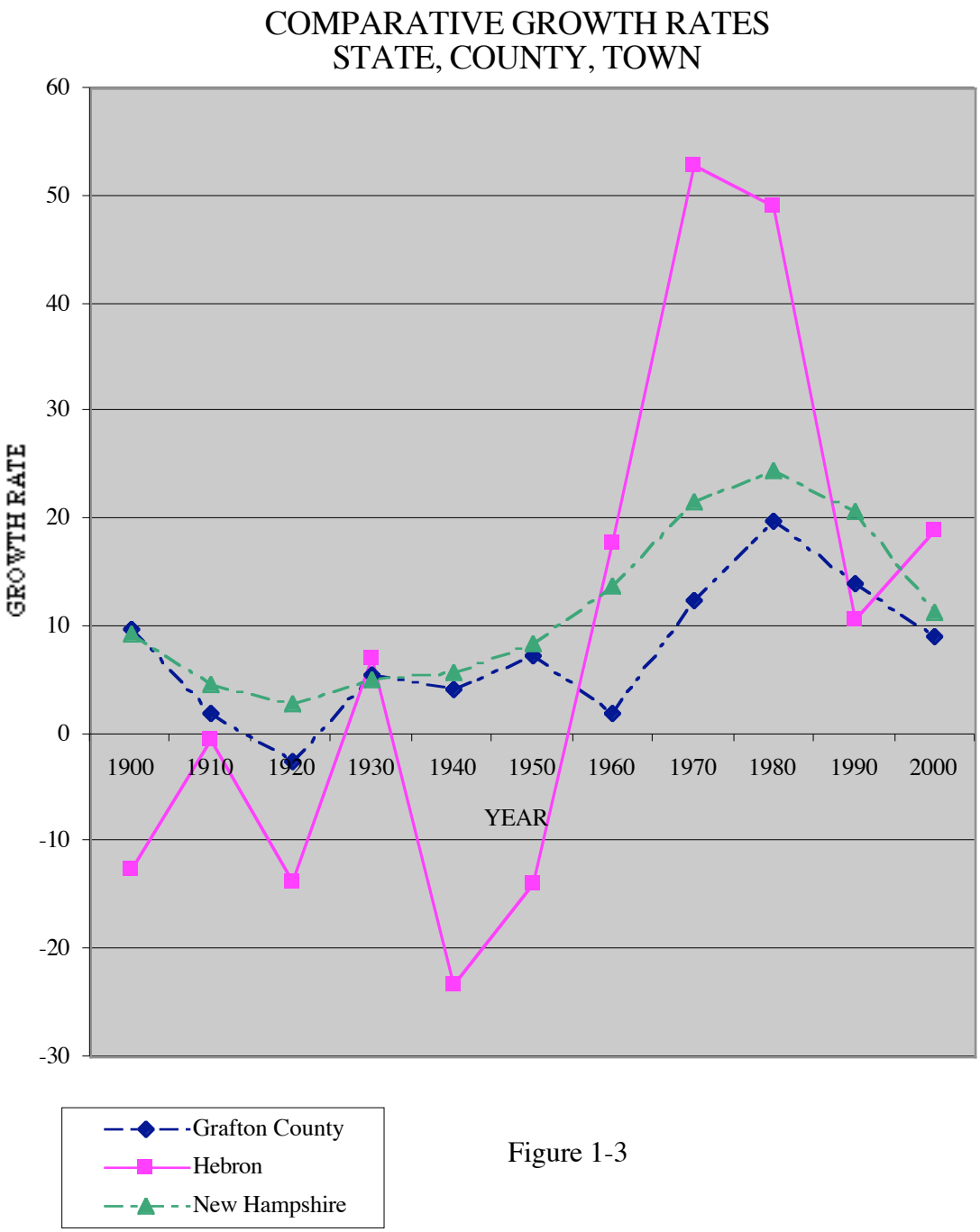

COMPARATIVE GROWTH RATES
STATE, COUNTY, TOWN
GROWTH RATE
60
50
40
30
20
10
0
-10
-20
-30
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
YEAR
Grafton County
Hebron
New Hampshire

Figure 1-3

TABLE 1-2

Relative Share of Population: 1890-2000
Hebron, Grafton County, State of New Hampshire

Year	Hebron	Grafton County	Percent Hebron/G.C.	State of N.H.	Percent Hebron/State
1890	245	37,217	0.66	376,530	0.065
1900	214	40,844	0.52	411,588	0.052
1910	213	41,652	0.51	430,572	0.049
1920	184	40,572	0.45	443,083	0.042
1930	197	42,816	0.46	465,293	0.042
1940	151	44,645	0.34	491,524	0.031
1950	130	47,923	0.27	533,242	0.024
1960	153	48,857	0.31	606,921	0.025
1970	234	54,914	0.43	737,578	0.032
1980	349	65,731	0.53	918,827	0.038
1990	386	74,929	0.52	1,109,252	0.035
2000	459	81,743	0.56	1,235,786	0.037

C. Population Density

Population density remains very low in Hebron. Between 1990 and 2000, it increased from 23.0 to 27.2 persons per square mile. Figure1-4 shows how Hebron's population density compares with neighboring towns.

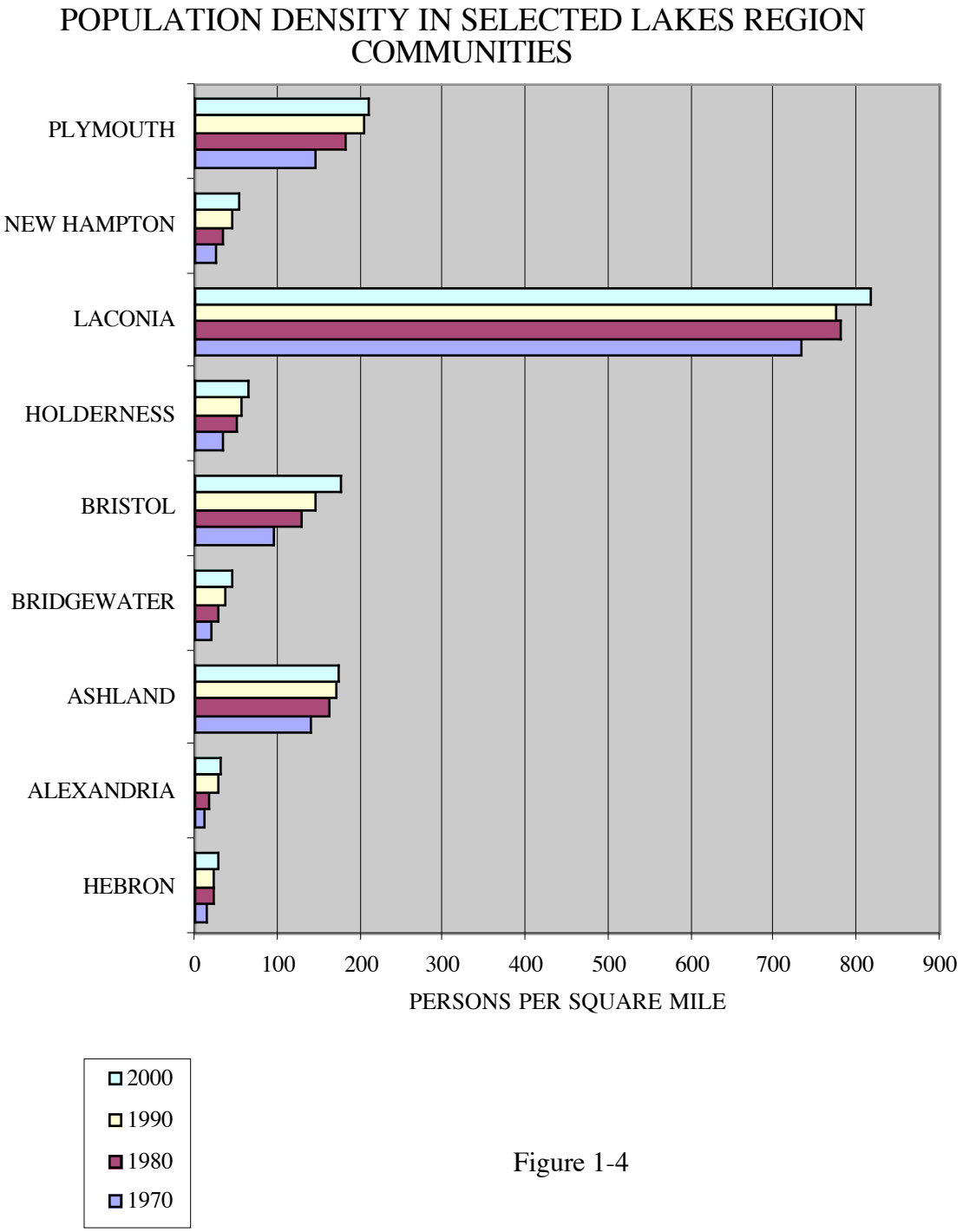

POPULATION DENSITY IN SELECTED LAKES REGION COMMUNITIES
PLYMOUTH
NEW HAMPTON
LACONIA
HOLDERNESS
BRISTOL
BRIDGEWATER
ASHLAND
ALEXANDRIA
HEBRON
0
100
200
300
400
500
600
700
800
900
PERSONS PER SQUARE MILE
2000
1990
1980
1970

Figure 1-4

D. Seasonal Population

Seasonal population figures, per se, are not captured in the U.S. Census, but data on seasonal and year-round housing units are collected and inferences on seasonal population may be drawn from these data. As shown in Table 1-3 and Figure 1-5, Hebron had 167 housing units (116 seasonal, 51 year-round) in 1960. There was a net change of 248 units (164 seasonal, 84 year-round) over the next two decades, then the ratio of seasonal to year-round began to change. Between 1980 and 2000, there was a net change of 102 housing units, but only 31 were seasonal while 71 were year-round. In the forty-year period 1960-2000, the percentage of the total housing units that were seasonal dropped from 70 percent to 60 percent.

It is probable that the seasonal population will continue to grow, but at a slower rate than the resident population as more seasonal units are converted for year-round occupancy.

TABLE 1-3
Housing Units in Hebron

	Seasonal Units			Year-Round Units			Total Units	
Year	No.	% Change	% of Year-Round Units	No.	% Change	% of Year-Round Units	No.	% Change
1960	116	---	69.5	51	---	30.5	167	---
1970	189	62.9	70.5	79	54.9	29.5	268	60.5
1980	280	48.1	67.5	135	70.9	32.5	415	54.9
1990	267	-4.6	59.1	185	37.0	40.9	452	8.9
2000	311	16.5	60.2	206	11.4	39.8	517	14.4

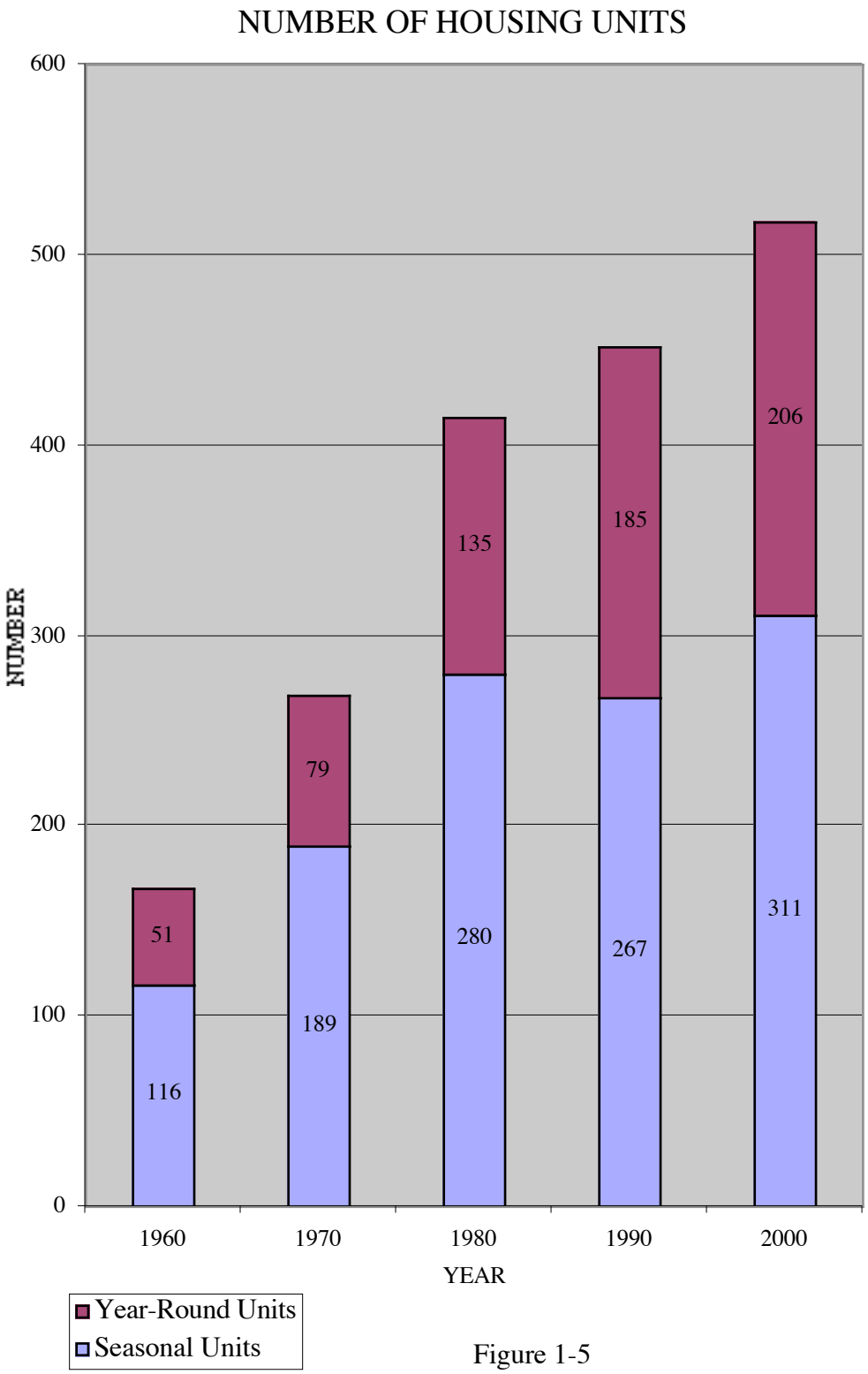

NUMBER OF HOUSING UNITS
600
500
400
300
200
100
0
NUMBER
51
116
79
189
135
280
185
267
206
311
1960
1970
1980
1990
2000
YEAR
Year-Round Units
Seasonal Units

Figure 1-5

III. AGE DISTRIBUTION

The age composition of a community has a substantial influence on the relative demand for local public services (schools, recreation, senior services, etc.). Table 1-4 and Figure 1-6 provide an overview of the age distribution of Hebron's population.

TABLE 1-4

Hebron Population Distribution

	1960		1970		1980		1990		2000	
Age Groups	No.	%	No.	%	No.	%	No.	%	No.	%
0-4 Pre-School	14	9.2	15	6.4	33	9.5	15	3.9	24	5.2
5-19 School Age	29	18.9	48	20.5	57	16.4	74	19.2	58	12.6
20-64 Working Age	82	53.6	130	55.6	203	58.1	212	54.9	248	54.0
65+ Senior Citizens	28	18.3	41	17.5	56	16.0	85	22.0	129	28.1
Totals	153	100	234	100	349	100	386	100	459	100

A. Pre-School (0-4)

This age group showed a steep jump from 6% to almost 10% of the population in 1980, but then fell back to 4% in 1990 and was only 5% of the population in the 2000 census data. In absolute numbers though, the number of pre-school children in the period between 1960 and 2000 ranged from fourteen to thirty-three, so the twenty-four recorded in the 2000 census was a mid-point in the historical range.

B. School Age (5-19)

First, please note that this range is slightly different from that used in the 1985 Master Plan where the range was 5-17. The new range reflects the way the data was tabulated in the 2000 U.S. Census.

The size of the school-age population directly affects the town's single largest fiscal expenditure, that of educational facilities and busing. This group steadily increased in numbers from 29 students in1960 to 74 in 1990, but then dropped back to 58 in 2000. In terms of percentage of the total population, school-age students accounted for only 12.6% of the Town's population in the year 2000, the lowest in the past forty years.

C. Working Age (20-64)

This age group constitutes the vast majority of the community's labor force; however, it is understood that not all persons of this age group are actually in the labor force, employed or looking for employment. Many in the upper end of the age range are retirees. The age group also includes the majority of young households that will potentially contribute to the expansion of the younger age groups in the future. The "working age" group has continued to account for about 55% of Hebron's total population. In actual numbers, the working age population has grown steadily from 82 persons in 1960 to 248 in the year 2000.

Again, please note the change in the range from the 1985 Master Plan where the range was 18-64.

D. Senior Citizens (65+)

The percentage of the senior citizen population within Hebron during the 1960-1980 period dipped, at a time when many communities within the Lakes Region were experiencing an increase in the number of retirees. Hebron soon caught up with the regional trend, showing an increase in the senior citizen percentage of its population from 16% in 1980 to 28% in the year 2000. In actual numbers, the 2000 U.S. Census data shows129 senior citizens in Hebron, an increase of 73 since the 1980 figure included in the 1985 Master Plan.

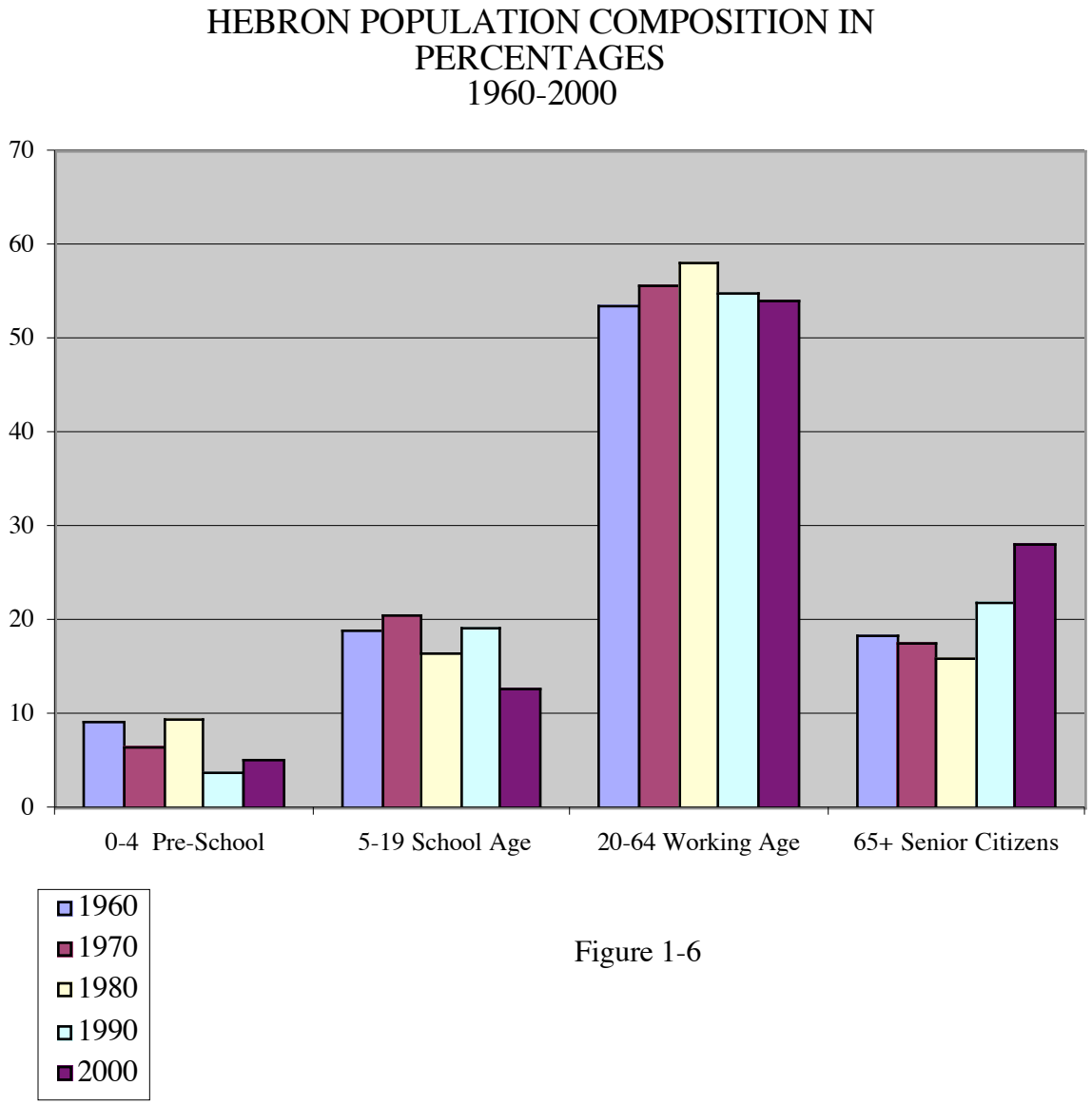

HEBRON POPULATION COMPOSITION IN PERCENTAGES
1960-2000
70
60
50
40
30
20
10
0
0-4 Pre-School
5-19 School Age
20-64 Working Age
65+ Senior Citizens
1960
1970
1980
1990
2000

Figure 1-6

IV. POPULATION PROJECTIONS

Understanding the future population level of a community is most important in estimating land use and public facility needs as well as the private market demands for housing and retail services.

Projecting long-term future population for a small community such as Hebron is difficult due to the substantial impact individual projects, such as the addition of a large subdivision, roadway changes, and industry can have on an individual town's development pattern. Nevertheless, the extrapolation of existing trends can provide a general estimate of future population, based upon the assumption of the continuation of these trends.

The 1985 Master Plan used "least squares curve fitting" and ratio techniques to project Hebron's population growth from the 1980 Census. The least squares projection was far off the mark – projecting a population of 536 in 2000 whereas the actual population was 459. The ratio technique, which assumed that Hebron would maintain its 1980 percentage – approximately .04% - of the State's population, projected a year 2000 population of 483. The actual percentage of the State's population who lived in Hebron in the year 2000 was .037%. Using that percentage figure and the most current population projection available from the State's Office of Energy and Planning, projections for Hebron's population are:

TABLE 1-5

Projection Based on New Hampshire's Population Growth Projections

Year	N.H. Population Projection	Hebron %	Population Projection .037% of State
2000			459
2010	1,393,000	0.037	515
2015	1,463,000	0.037	541
2020	1,528,000	0.037	565

In 2003, the OEP (then known as the Office of State Planning) projected that Hebron's population would be 500 in the year 2005. This projection was based on projections for Grafton County. In July 2004, the OEP estimated that Hebron's population in 2003 was 523, an increase of sixty-four residents in three years or about twenty-one per year – three times the average annual increase during the 1990s. Note that this estimate of 523 is 23 more than their own projection of 500 for the year 2005. Using Grafton County as a basis for projecting Hebron's population didn't pan out, even in the short term. If the OEP population 2003 estimate of 523 is correct, the Table 1-5 projection to 515 in 2010 would appear to be too low. If the Town continues to add an average of twenty-one residents each year, as it has done in the past three years, the projected population in 2010 would be 669.

We can look at the number of new houses being built each year to get another possible basis for projecting population growth. As shown in Table 1-3, the total number of housing units listed in the 2000 census was 517. Current OEP data show that there were 539 housing units in Hebron in 2001 (an increase of 22 in one year) and 548 in 2002 (an increase of 9 in one year). Using these data, the average number of houses being built each year is15.5. If we assume that the percentage of year-round residences will continue to be about 40 percent of the total housing stock, then about six of the homes built each year will house permanent residents. In the 2000 census, there were 459 residents living in 206 "occupied housing units", or about 2 people per residence. Thus we might project that if the growth in housing continues at or near the same rate as it has in the past two years, about 12 new residents would be added to Hebron's population each year.

Many factors will likely contribute to Hebron's housing growth: the health of the State's and the Nation's economy; interest rates for home mortgages; local employment opportunities; demand for vacation homes; and the number of retirees seeking to make Hebron their primary residence. Many of these factors are inter-related; none lend themselves to confident predictions. Figure 1-7 shows graphically the three population projections discussed above. Which projection will prove to be the best predictor in the year 2010? That is anybody's guess, but the sharp increase in the number of development proposals coming before the Hebron Planning Board would seem to support one of the more aggressive projections, at least for the next few years.

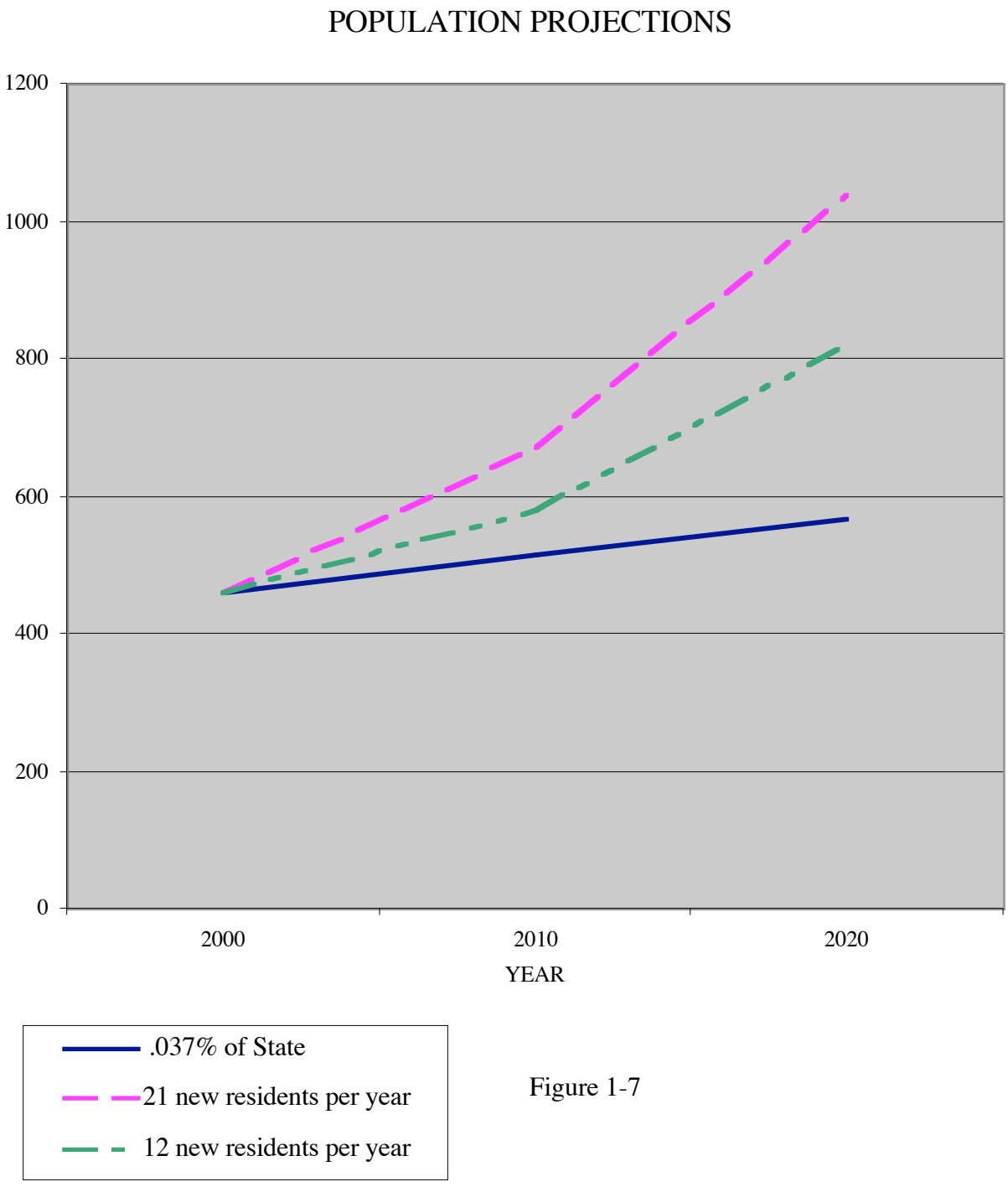

POPULATION PROJECTIONS
1200
1000
800
600
400
200
0
2000
2010
2020
YEAR
.037% of State
21 new residents per year
12 new residents per year

Figure 1-7

Chapter 2

COMMUNITY INPUT

I. INTRODUCTION

The Planning Board solicited input to the Master Plan from the taxpayers and residents of Hebron through:

- A Community-wide Open Meeting;
- The *Hebron Master Plan Community Survey* which was sent to all property tax payers, both resident and nonresident;
- Two focus groups – one of senior citizens, one of parents of school-age children – to identify any special concerns of these groups and to articulate a vision of Hebron ten years from now.

II. COMMUNITY-WIDE OPEN MEETING

The Planning Board held a community-wide open meeting on September 13, 2001. The full minutes of the meeting are in Appendix A.

Nancy Johnson, Facilitator from the Lakes Region Planning Commission explained the purpose of a master plan, quoting from *The New Hampshire Planning and Land Use Regulation* manual section RSA674:2:I-II:

> ”The purpose of the master plan is to set down as clearly and practically as possible the best and most appropriate future development of the area under the jurisdiction of the planning board, to aid the board in designing ordinances that result in preserving and enhancing the unique quality of life and culture of New Hampshire, and to guide the board in the performance of its other duties in a manner that achieves the principles of smart growth, sound planning, and wise resource protection”.

> " The master plan shall be a set of statements and land use and development principles for the municipality with such accompanying maps, diagrams, charts, and descriptions as to give legal standing to the implementation ordinances and other measures of the planning board. Each section of the master plan shall be consistent with the others in its implementation of the vision section. …".

Ms Johnson explained that the Master Plan is a legal document and would provide a legal defense if zoning ordinances were challenged in court. People attending the meeting were asked to comment on a) what they liked about Hebron, b) what they disliked about Hebron, and c) what important issues would have to be faced by the Town in the future. The views expressed were used as a starting point in developing the *Hebron Master Plan Community Survey*.

The stated goals in the *1985 Hebron Master Plan* were then discussed and found to be generally pertinent to Hebron today with the few exceptions noted in the minutes of the meeting (see Appendix A). The recommendations of the *1985 Master Plan* were not presented or discussed, but are listed below because they are a logical extension of the goals.

1985 Hebron Master Plan Goals

1. Promote a well-balanced land use pattern capable of meeting present and future community needs in an efficient, environmentally sound, economical, equitable and aesthetically pleasing manner.

2. Preserve and enhance the natural shorefront advantages of Newfound Lake, establishing policies that serve to protect this water resource from degradation.

3. Guide growth at a moderate rate consistent with the Town's ability to absorb it, with minimal adverse affect on the Town's resources and services.

4. Ensure adequate housing for all residents in a healthful, safe, convenient and attractive living environment.

5. Provide quality community facilities and services including road maintenance and improvements, which will most efficiently meet the needs of the Town.

6. Encourage the preservation of individual and collective historic resources so that Hebron's heritage can be carried forward.

7. Encourage modest, selected growth and diversification of those economic activities that will provide employment opportunities, while preserving the rural qualities that are the primary basis for the Town's overall economy.

8. Provide a variety of recreational activities and opportunities for all age groups in accordance with current and projected needs of the community.

9. Provide improvement and upgrading of existing roads which will provide efficient, safe and pleasant movement of people and good within the Town, while maintaining the scenic character of the Town's rural roads.

1985 Master Plan Recommendations

1. The Town should continue local land use regulations which will help retain its small-town rural residential character. According to the Community Survey, both year-round and seasonal residents would prefer to see Hebron remain as a quiet, peaceful rural residential community. Local land use regulations should reflect this desire.

2. In reviewing development proposals, particularly during site plan review, consider scenic views and vistas. An adjustment, many times very small in the site plan could prevent the obstruction of an important scenic view.

3. Consider requiring a setback of 125 feet for septic system leach fields from Newfound Lake. Studies have indicated that septic system effluent can travel distances greater than the State's 75-foot setback requirement, particularly depending upon soil and slope conditions. A 125-foot setback is considered reasonable to prevent water pollution.

4. The conversion of large single-family homes, cottage colonies or cabins to condominium ownership or uses of greater intensity throughout the Lakes Region have posed health and safety issues relative to on-site water and sewer systems. It is recommended that communities adapt regulations regarding conversions of a dwelling from seasonal to a more intensified year-round use. Units being converted to condominiums or other similar use should usually be considered a change in use, and should always be reviewed with respect to density, water and sewer systems, parking and access, impact on water bodies and other health and safety issues.

5. Hebron should guide its future growth and development to close proximity of its existing road system rather than the more hilly and distant outlying areas of the town. The town will maintain open space in areas that are less suitable for development purposes, as well as minimize new road mileage for future maintenance and minimize travel distances for fire, police, rescue and highway departments.

6. Encourage cluster housing as a development option which will provide a developer the flexibility to design a site plan which will (a) locate buildings on the best soils; (b) provide more open space for recreation and natural beauty; (c) design a more efficient roadway and utility pattern; (d) maximize the benefit of scenic views or natural site amenities such as vegetative buffers, solar space or waterfront areas; and (e) minimize road maintenance and help prevent strip development.

7. Encourage landowners to seek technical forestry expertise to develop a forest management plan for any area which will be logged. The professional forester can help the landowner develop a plan which will avoid environmental problems and ensure a long-term sustained yield. He can also inform the landowner about the quantity and market value of his forest lands and, in some cases, prevent loggers from taking advantage of uninformed landowners.

8. Maintain and strengthen regulation measures to protect steep slopes, wetlands and floodplains in Hebron, Each of these, steep slopes, wetlands and floodplains are classified as "critical resources," and should be protected from development. Slopes exceeding 25% will, if developed, pose serious erosion, sewage disposal and visual problems; development occurring in flood hazard areas pose risks to structures and residents located within the floodplain boundaries.

9. The Town and its citizens should encourage the protection, preservation, enhancement and renovation of buildings of architectural and historical significance.

10. Continue the inventory of historic structures and sites within the community. The historic resource inventory included in this report should be expanded so that eventually all historical resources will be inventoried. The work already accomplished provides a base for future efforts.

III. HEBRON MASTER PLAN COMMUNITY SURVEY

The Planning Board formed a subcommittee of Hebron residents who devised a survey instrument, the *Hebron Master Plan Community Survey*. The Subcommittee used the input gathered at the community-wide open meeting as a starting point in designing the questions, and also drew on questions used in the 1985 Master Plan process as well as the experience of other towns in the Lakes Region.

The survey questionnaire (see Appendix B) was mailed out to all Hebron taxpayers, both resident and nonresident, in early 2003. Two hundred and twenty four questionnaires were returned - a response rate of approximately 34%. Detailed tabulations can be found in the report, *Responses to the Hebron Master Plan Questionnaire 2003*, written by Ralph Larson and available at Town Hall.

The remaining part of this section is devoted to charts and graphs derived from the data tabulations. Please note that all the numbers and percentages in the charts and graphs are based only on responses to the question - missing values for a question were not included in the analysis.

A. Who Responded to the Questionnaire?

Figures 2-1, 2-2, and 2-3 give a profile of the respondents in terms of age, permanent residence, and how long they have owned property in Hebron. Many of the opinion data items are broken down by "resident/nonresident", but none are correlated by age or by how long the respondent owned property in Hebron.

B. Questions Concerned with Living in Hebron?

Figures 2-4 through 2-6 show how the respondents feel, in general, about living in Hebron: the best things, things that could be improved, the most serious problems, and their reactions to given statements about the Town.

C. Questions Concerned with Future Growth and Development

Figures 2-7 through 2-12 show how the respondents feel about population growth, housing development, open spaces, and spaces for recreation.

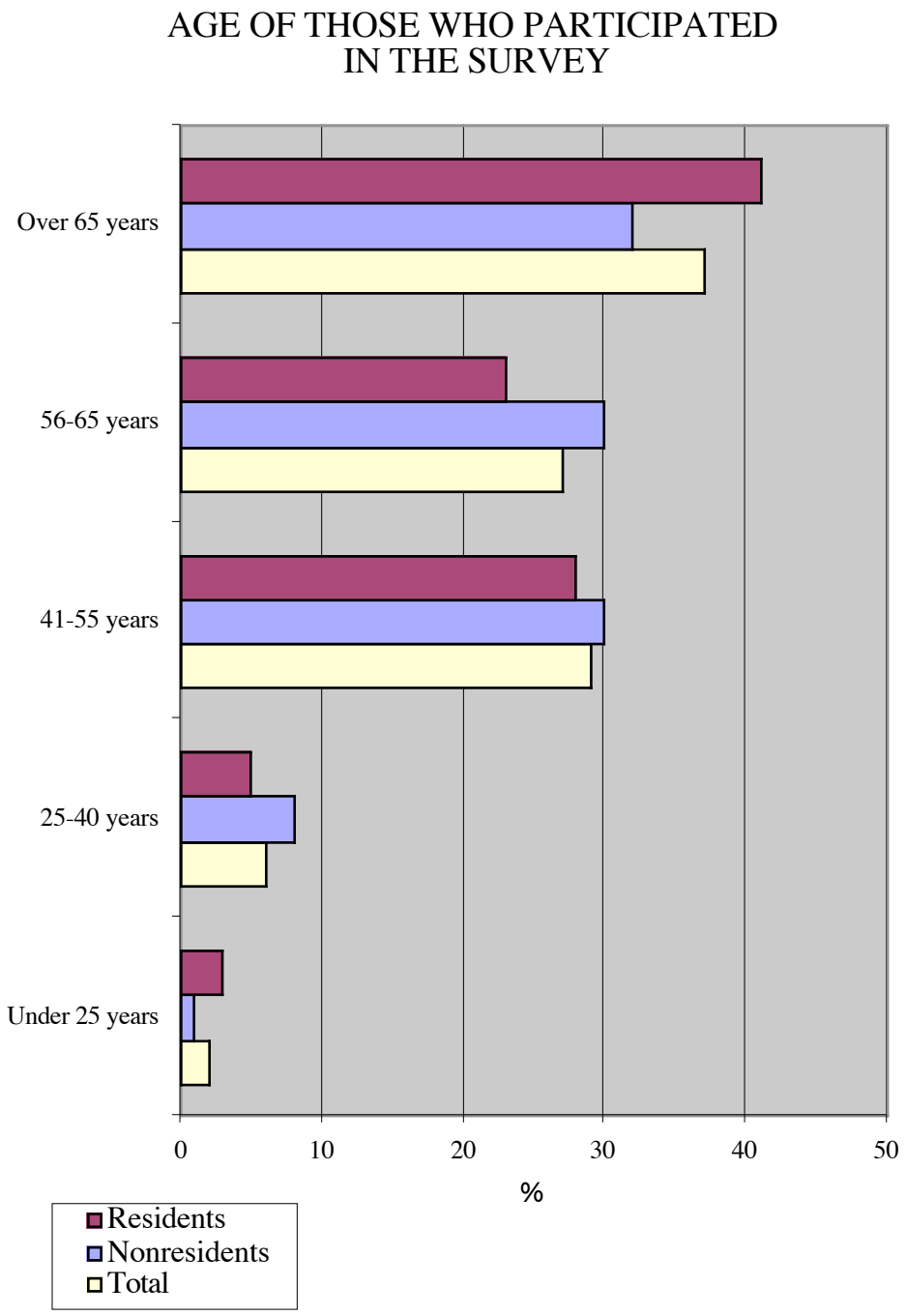

AGE OF THOSE WHO PARTICIPATED
IN THE SURVEY
Over 65 years
56-65 years
41-55 years
25-40 years
Under 25 years
0
10
20
30
40
50
%
Residents
Nonresidents
Total

Figure 2-1

HOW LONG HAVE YOU OWNED PROPERTY IN HEBRON?

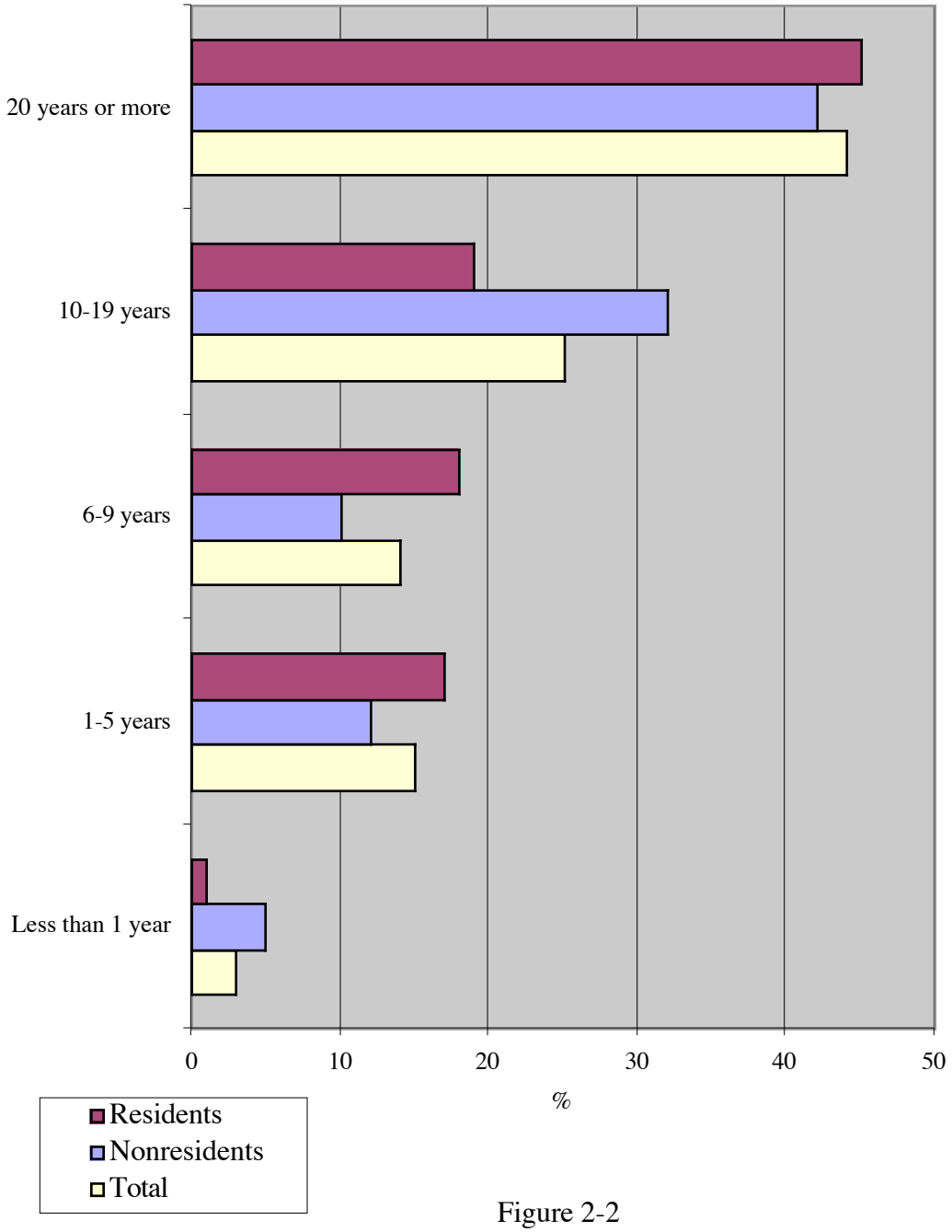


Figure 2-2

WHERE IS YOUR PERMANENT RESIDENCE?

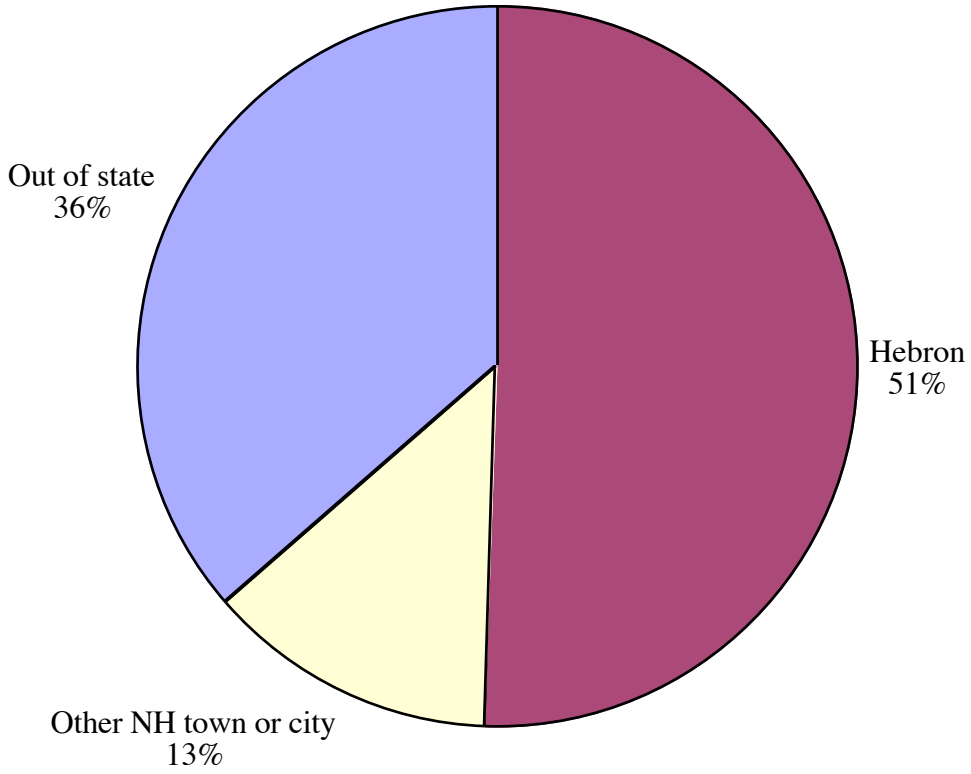


Figure 2-3

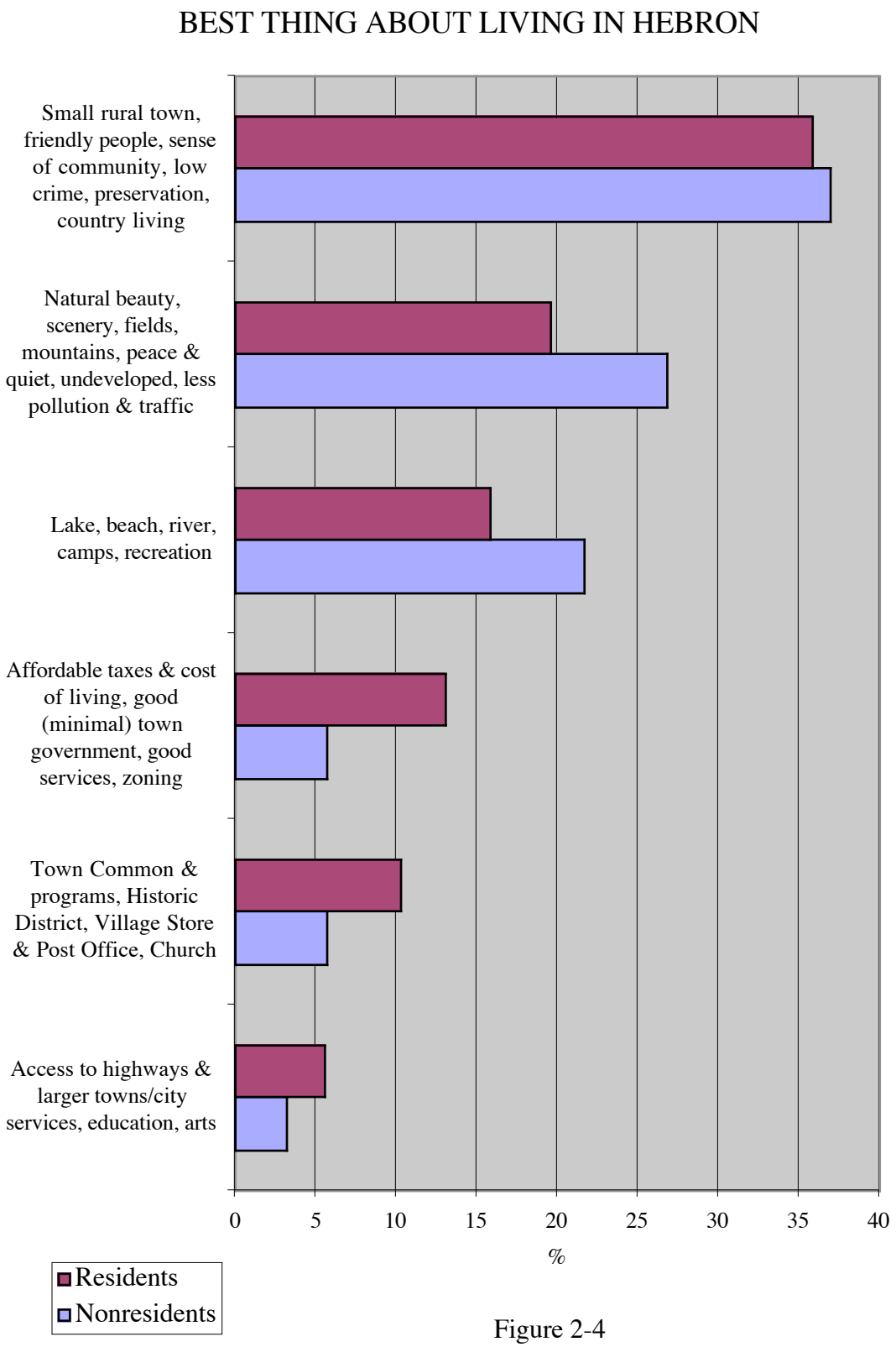

BEST THING ABOUT LIVING IN HEBRON
Small rural town, friendly people, sense of community, low crime, preservation, country living
Natural beauty, scenery, fields, mountains, peace & quiet, undeveloped, less pollution & traffic
Lake, beach, river, camps, recreation
Affordable taxes & cost of living, good (minimal) town government, good services, zoning
Town Common & programs, Historic District, Village Store & Post Office, Church
Access to highways & larger towns/city services, education, arts
0
5
10
15
20
25
30
35
40
%
Residents
Nonresidents

Figure 2-4

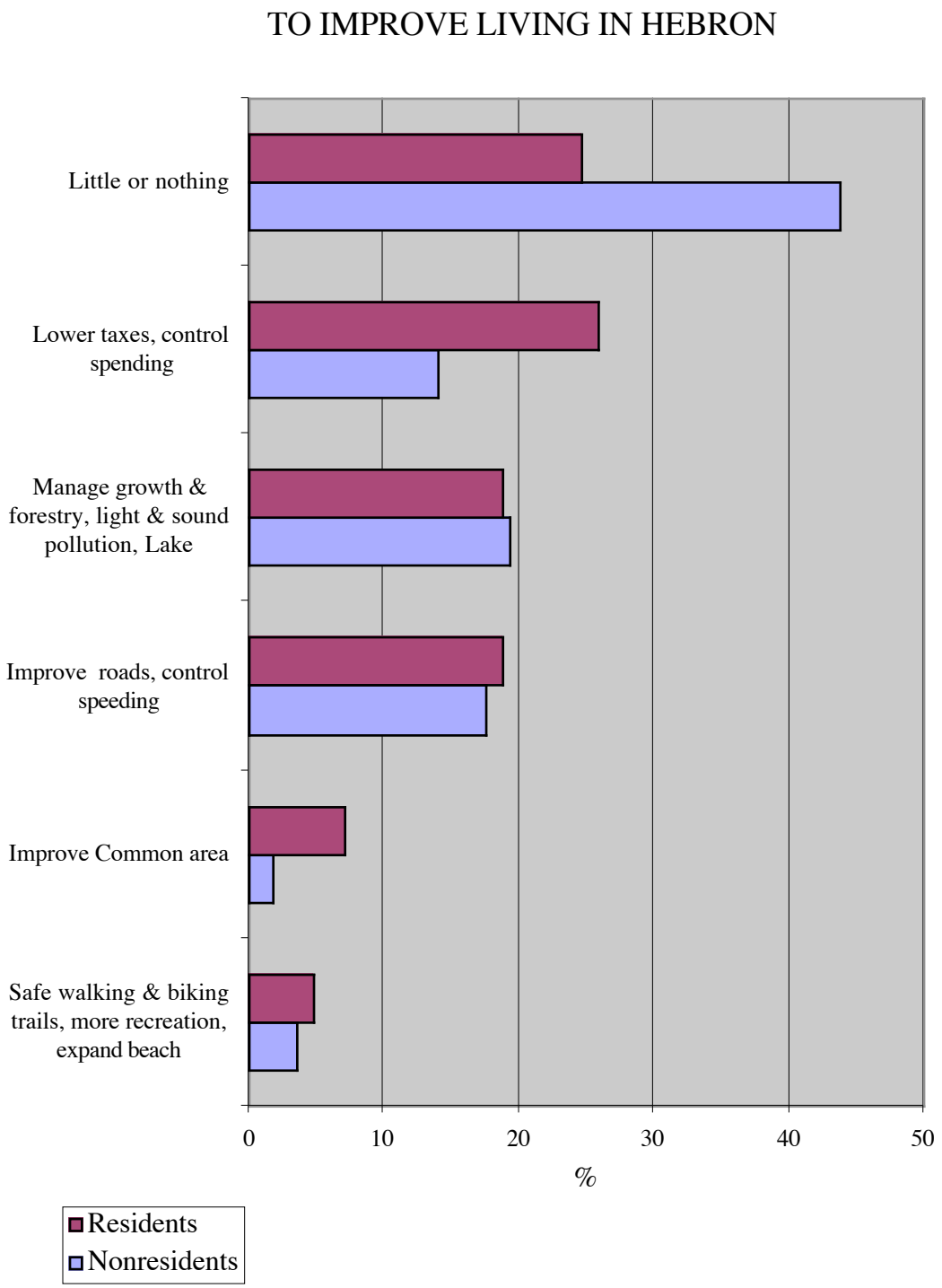

TO IMPROVE LIVING IN HEBRON
Little or nothing
Lower taxes, control spending
Manage growth & forestry, light & sound pollution, Lake
Improve roads, control speeding
Improve Common area
Safe walking & biking trails, more recreation, expand beach
0
10
20
30
40
50
%
Residents
Nonresidents

Figure 2-5

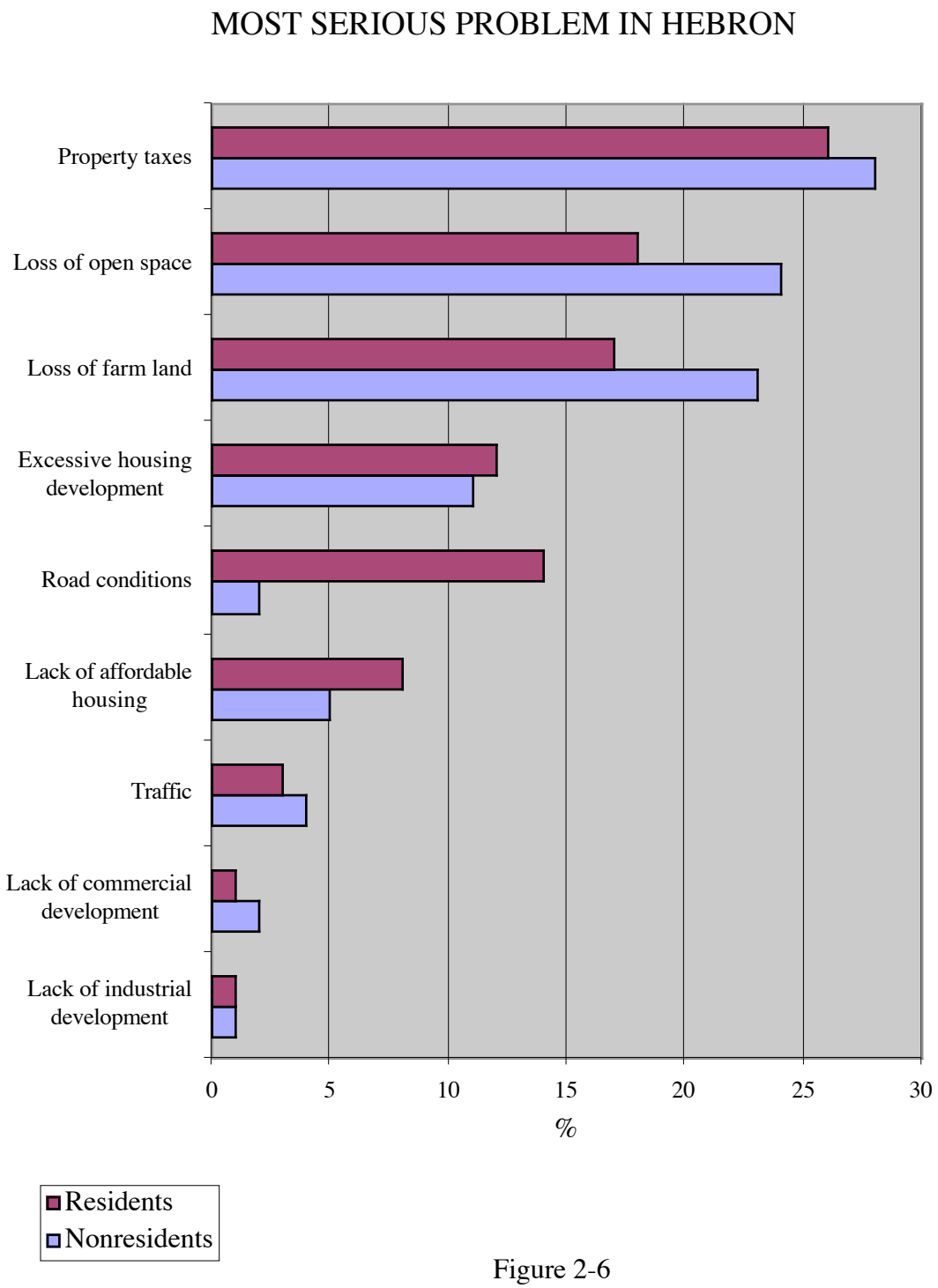
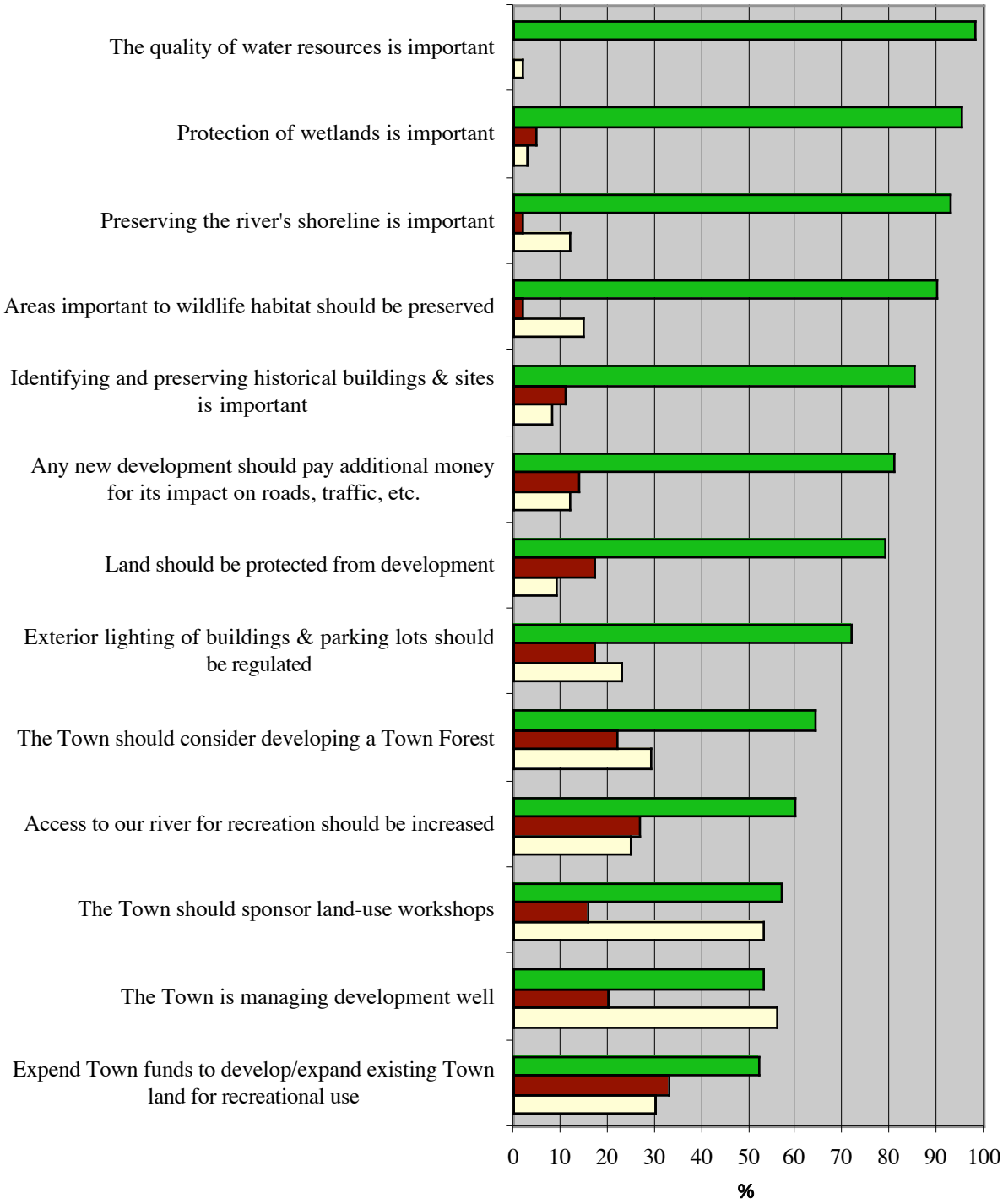

MOST SERIOUS PROBLEM IN HEBRON
Property taxes
Loss of open space
Loss of farm land
Excessive housing development
Road conditions
Lack of affordable housing
Traffic
Lack of commercial development
Lack of industrial development
0
5
10
15
20
25
30
%
Residents
Nonresidents

Figure 2-6

DO YOU AGREE WITH THE FOLLOWING STATEMENTS?



Note: Only statements with over 50% agreement are included

Figure 2-7

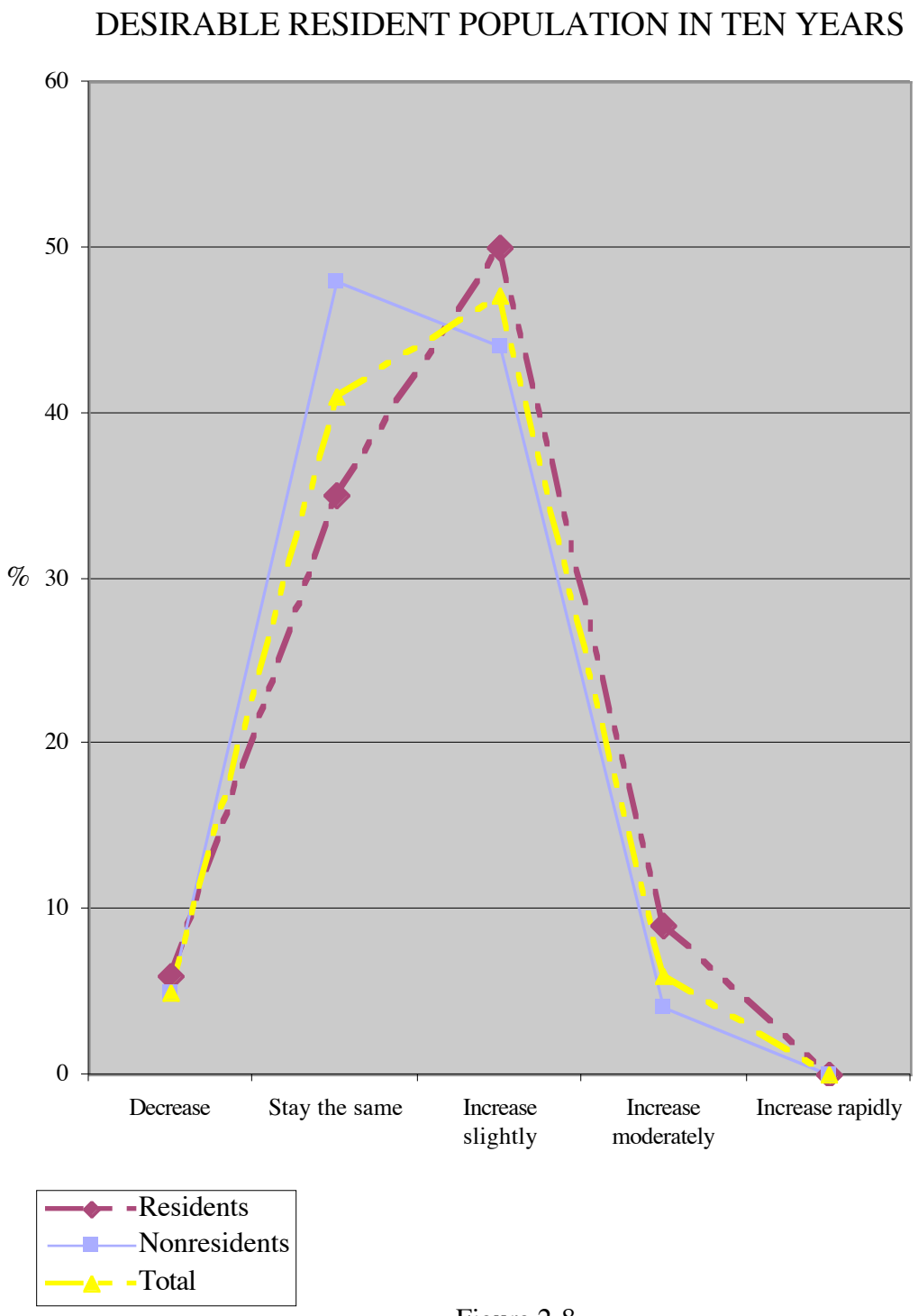

DESIRABLE RESIDENT POPULATION IN TEN YEARS
60
50
40
30
20
10
0
%
Decrease
Stay the same
Increase slightly
Increase moderately
Increase rapidly
Residents
Nonresidents
Total

Figure 2-8

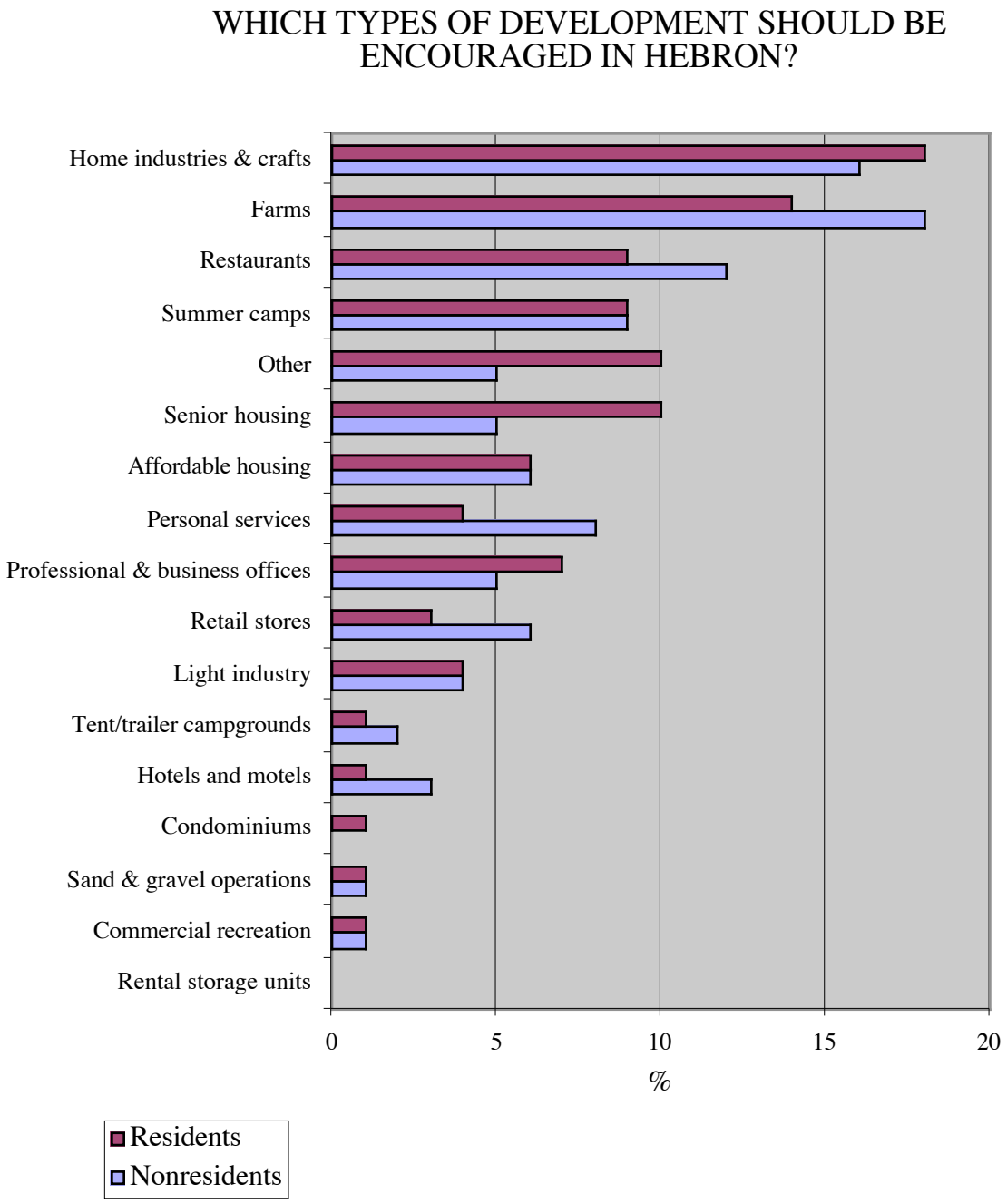

WHICH TYPES OF DEVELOPMENT SHOULD BE ENCOURAGED IN HEBRON?
Home industries & crafts
Farms
Restaurants
Summer camps
Other
Senior housing
Affordable housing
Personal services
Professional & business offices
Retail stores
Light industry
Tent/trailer campgrounds
Hotels and motels
Condominiums
Sand & gravel operations
Commercial recreation
Rental storage units
0
5
10
15
20
%
Residents
Nonresidents

Figure 2-9

DESIRABLE USE OF UNDEVELOPED LAND OWNED BY TOWN

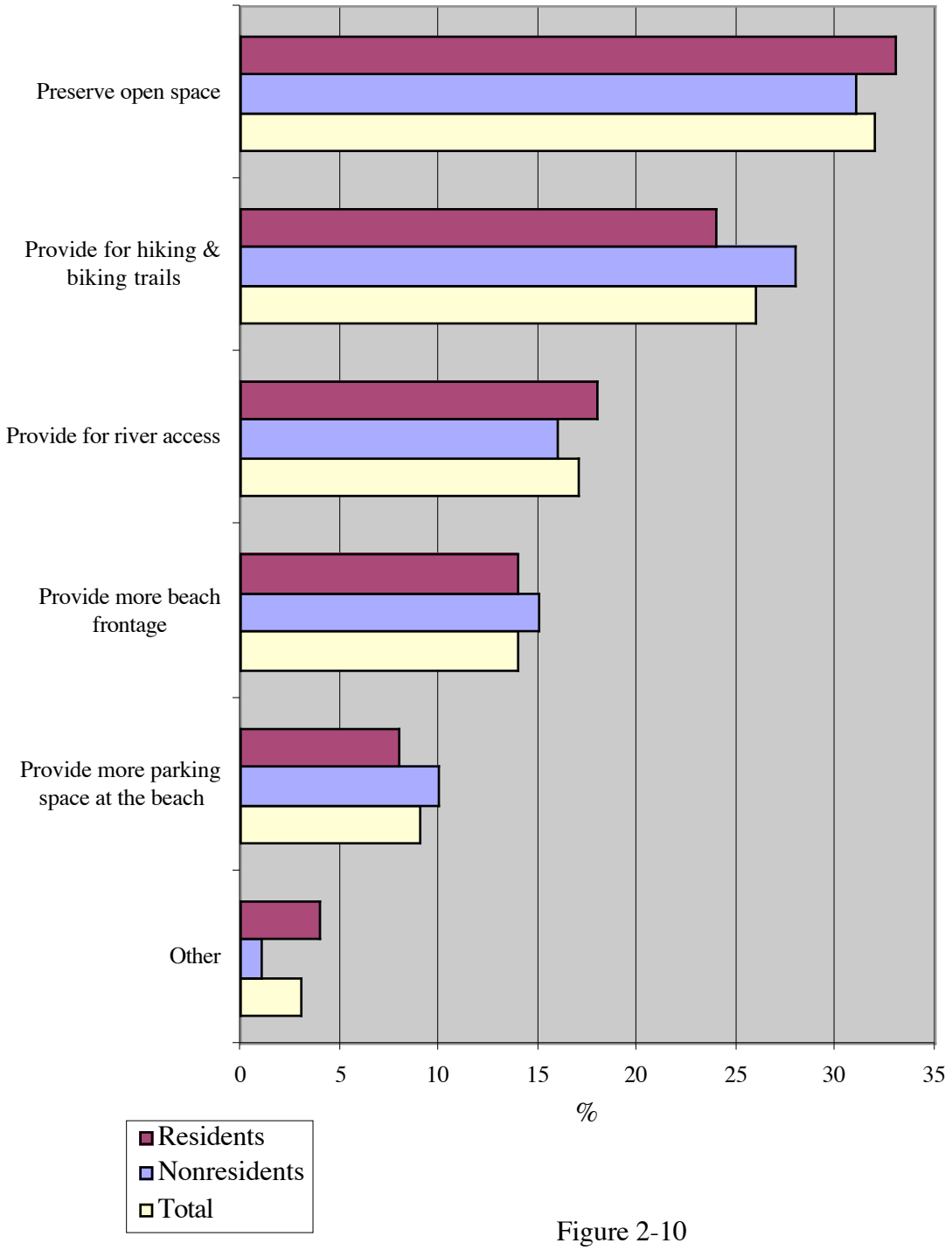


Figure 2-10

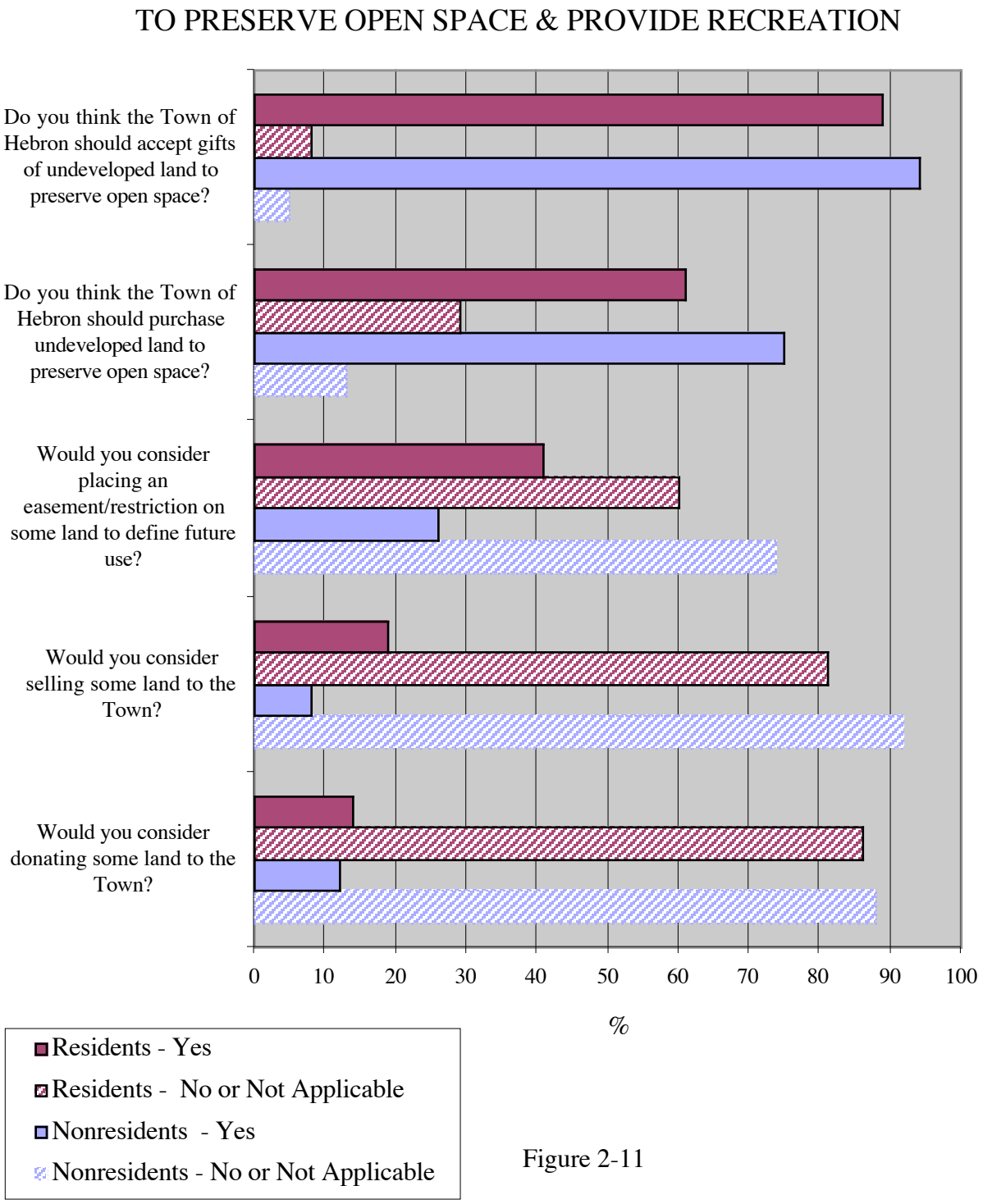

TO PRESERVE OPEN SPACE & PROVIDE RECREATION
Do you think the Town of Hebron should accept gifts of undeveloped land to preserve open space?
Do you think the Town of Hebron should purchase undeveloped land to preserve open space?
Would you consider placing an easement/restriction on some land to define future use?
Would you consider selling some land to the Town?
Would you consider donating some land to the Town?
0
10
20
30
40
50
60
70
80
90
100
%
Residents - Yes
Residents - No or Not Applicable
Nonresidents - Yes
Nonresidents - No or Not Applicable

Figure 2-11

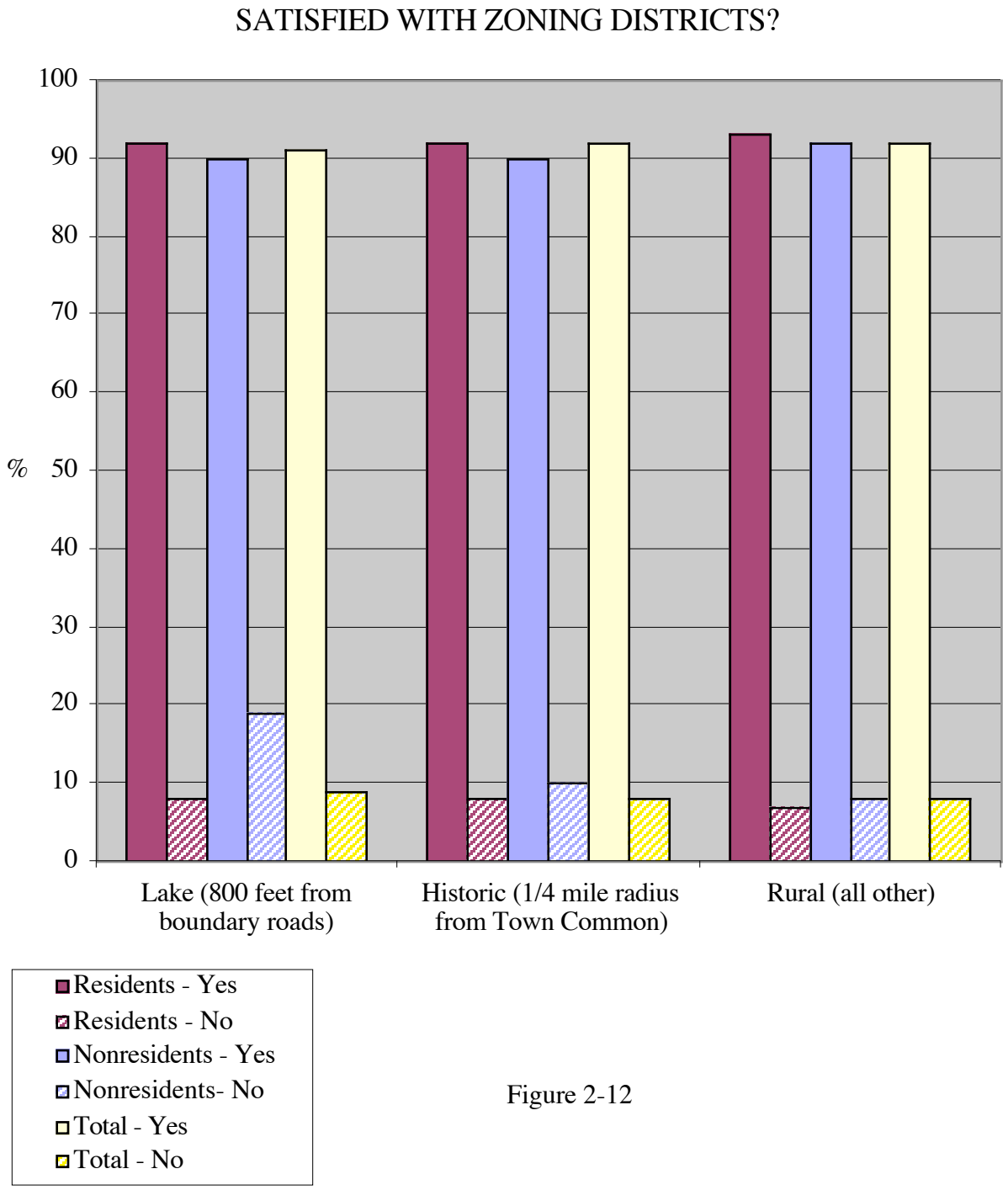

SATISFIED WITH ZONING DISTRICTS?
100
90
80
70
60
%
50
40
30
20
10
0
Lake (800 feet from boundary roads)
Historic (1/4 mile radius from Town Common)
Rural (all other)
Residents - Yes
Residents - No
Nonresidents - Yes
Nonresidents- No
Total - Yes
Total - No

Figure 2-12

IV. FOCUS GROUPS

The two largest demographic groups in Hebron are retirees and parents of school-age children. Responses to the *Hebron Master Plan Community Survey* were not correlated by age, so the charts and graphs in this chapter do not give a sense of any special concerns of these demographic groups. To remedy this problem, two focus groups were formed during the summer and fall of 2004. The members of each group were provided with copies of the charts and graphs contained in Chapters 1 and 2 of this document. They were asked to pull from these data, and from their own experience as members of the Hebron community, a vision of the Hebron they would like to see in ten years. Each focus group then held one meeting in which the vision statements of the individual members were melded by consensus into a vision statement for the group.

The vision statements of the two focus groups were remarkably similar, showing clear consensus on housing, development, the environment, business and industry, roads, the Historic District, and fiscal responsibility. The vision of the retirement-age group specifically mentioned housing for the elderly, a community hall, and handicapped accessibility to public buildings. The vision of the parents of school-age children included quality education, improving the Hebron Library, and creating more family and individual recreation facilities such as a playground, volleyball courts, picnic tables, and safe walking, jogging, and bicycle paths.

A composite of the two vision statements appears in the introductory pages of this document. The specific recommendations contained in the Master Plan are inspired by, and logically follow from, the vision statements of the focus groups as informed by the data gathered in the *Hebron Master Plan Community Survey*. We trust that their collective vision will provide sound guidance to the Town of Hebron and its Planning Board over the next decade and beyond.

Chapter 3

LAND USE

I. INTRODUCTION

The Town of Hebron is located in central New Hampshire in Grafton County, and is bordered on the north by Groton, on the east by Plymouth, on the west by Alexandria, and on the south by Bristol and Bridgewater. The Town is comprised of approximately 16.9 square miles of land area (10,816 acres) and 2.1 square miles (1,344 acres) of inland water area. The topography is generally hilly with areas of steep slopes found throughout the town. Approximately 55 percent of the land area in Hebron has some degree of development limitations based on steep slopes (15% slope or greater). The most prominent elevations are Hobart Hill, Tenney Hill, and Bear Mountain. Newfound Lake (4,106 acres) is the largest body of water, with shoreline in Hebron, Bridgewater, Bristol, and Alexandria. Spectacle Pond is shared with Groton. Other surface waters in Hebron include Cilley, Fretts, Wise, Tannery, and Georges/Bog brooks, and the Cockermouth River.

Water and sewer systems are privately maintained throughout the community. Public Service of New Hampshire (PSNH) provides 90% of the electric power for the community with New Hampshire Electric Cooperative providing the remainder. The Town has paid volunteers who provide emergency medical technician (EMT) and fire assistance for the community, as well as for the neighboring town of Groton. A new public safety building, to house all emergency services, has recently been completed.

Most Hebron school-age children attend the Bridgewater/Hebron School (K-5) located in Bridgewater, the Newfound Memorial Middle School (6-8) located in Bristol, and the Newfound Regional High School, also located in Bristol. The nearest community college is Laconia Community/Technical College; the nearest college is Plymouth State University in Plymouth. There are no childcare facilities, adult homes, or assisted living homes located in Hebron.

According to the U.S. Census (2000), 34.8 percent of all the housing units in Hebron were more than 60 years old (built before 1940), while 33.7 percent were built since 1980. In 2000, there were 517 housing units, of which 294 units were for seasonal, recreational, or occasional use. NH Office of Energy and Planning (OEP) data show that 31 houses were built in Hebron in the years 2001 and 2002, bringing the total at the end of 2002 to 548.

II. DEVELOPED LAND USE

The developed land in Hebron is comprised of 97% residential properties. The remaining 3% include municipal facilities and limited commercial uses such as youth camps, a marina, and a general store. Structural footprints (houses, commercial buildings, parking lots, etc.) make up less than 1% of the total land area in Hebron. The outlying undeveloped land in Hebron is predominately comprised of forest and steep slopes. The declining importance of agriculture has resulted in a substantial amount of forested acreage, much of which is second growth timber. Forestland represents 82% (8,869 acres) of the total land area in Hebron.

Much of the developed land in the community is in close proximity to Newfound Lake. Generally, light year-round residential development extends along town and state roads, with moderate development concentrations located at picturesque Hebron Village, East Hebron, and at the head of Sanborn Bay on Newfound Lake. Medium to heavy seasonal development is to be found along the shoreline of Newfound Lake. The large amount of shoreline within the Town's borders has in past decades provided the dominant influence on development patterns, but residential development has recently spread to some of the more remote and hilly parts of Town. For example, the recently subdivided 300-acre parcel at the top of Hobart Hill has been approved for thirty-nine houses.

A. Community Facilities

Community facilities, defined as areas for public and semipublic use, include town buildings and grounds (Town Hall, Safety Building, Town Shed, Library, Town Common, Memorial Beach, Charles L. Bean Sanctuary), the Union Congregational Church and Cemetery, the three Audubon Society sanctuaries (Paradise Point, Ash Cottage, Bear Mountain), the Community Forests of New Hampshire's (CFNH) J. Tyson Stokes Memorial Forest in East Hebron, the Society for the Protection of New Hampshire Forests's (SPNHF) Flint Memorial Forest, which abuts Spectacle Pond, and the Cockermouth Forest (in Hebron and Groton).

Owner	Acreage	Percent
Town of Hebron	46.5	0.4%
NH Audubon	166.2	1.5%
J. Tyson Stokes Forest	45.0	0.4%
Flint Memorial Forest	79.5	0.7%
Cockermouth Forest[1]	35.5	0.3%
Community Facilities Land	372.7	3.4%

Some other large tracts of land are held by privately-owned camps.

Owner	Acreage	Percent
Camp Berea	26.1	0.2%
Camp Mowglis	118.7	1.1%
Camp Pasquaney	564.5	5.2%
Camp Onaway	43.5	4.0%
Camp Wicosuta	36.2	0.3%
Total land owned by camps	626.8	5.8%

The 2003 Percent of Property Valuation by Type lists:

Residential Land and Buildings	92.9%
Commercial Land and Buildings	4.1%
Other Property including Utilities	3.0%

[1] The entire Cockermouth Forest covers 1002 acres: 35.5 acres in Hebron, the remainder in Groton.

B. Roads and Utility Lines

The existing road network and associated rights of way comprise approximately 150 acres in Hebron. This figure represents about 1.4 % of the Town's total area. By contrast, many larger communities with urban centers have approximately 20% of their total land area devoted to the road network.

Hebron presently has 38 individual roads covering approximately 30 miles of roadway. The majority of these roads are designated as Class V roads (27 roads; 6.5 miles): rural roads that the Town has the duty to maintain on a regular basis. Three roads (10 miles) are part of the New Hampshire primary or secondary highway system for which the State has the responsibility to maintain or reconstruct. Eight roads (6.5 miles) within Hebron are designated as Class VI roads: not maintained by the Town and generally not suitable for travel.

The major electric transmission line, covering 93 acres held in easement, passes through an unpopulated area in the western section of the township.

III. "CURRENT USE" TAXATION LAW

According to the *Real Estate Assessments for the Town of Hebron 2004* booklet, 2,777 acres or 26% of the land in Hebron is now being taxed under the provisions of New Hampshire RSA 79-A "Current Use Taxation." The acreage put into current use increased dramatically after the State's designation of Hebron as a "donor town" caused a sharp increase in property taxes. Because so much of Hebron's land is now in current use, but could be taken out of current use at some future time and developed, it is important to understand the terms of the statute.

What exactly is current use taxation?

NH RSA 79-A states:

> It is hereby declared to be in the public interest to encourage the preservation of open space, thus providing a healthful and attractive outdoor environment for work and recreation of the state's citizens, maintaining the character of the state's landscape, and conserving the land, water, forest, agricultural and wildlife resources. It is further declared to be in the public interest to prevent

the loss of open space due to property taxation at values incompatible with open space usage. Open space land imposes few if any costs on local government and is therefore an economic benefit to its citizens. The means for encouraging preservation of open space authorized by this chapter is the assessment of land value for property taxation on the basis of current use. It is the intent of this chapter to encourage but not to require management practices on open space lands under current use assessment.

"Current use value" means the assessed valuation per acre of open space land based upon the income-producing capability of the land in its current use, and not its real estate market value. This valuation shall be determined by the assessor in accordance with the range of current use values established by the board and in accordance with the class, type, grade and location of land.

"Land use change tax" means a tax that shall be levied when the land use changes from open space use to a non-qualifying use.

"Open space land" means any or all farmland, forest land, or unproductive land as defined by this section.

Is land in current use that is open to the public for recreational purposes taxed at a different rate?

The board shall reduce by 20 percent the current use value of land, which is open 12 months a year to public recreational use, without entrance fee, and which also qualifies for current use assessment under an open space category. There shall be no prohibition of skiing, snowshoeing, fishing, hunting, hiking or nature observation on such open space land, unless these activities would be detrimental to a specific agricultural or forest crop or activity. The owner of land who opens his land to public recreational use as provided in this paragraph shall not be liable for personal injury or property damage to any person, and shall be subject to the same duty of care as provided in RSA 212:34.

How much land in current use is open to the public for recreational purposes?

1705 acres in current use, largely owned by *Green Acres* and *Yankee Forest LLC*, are taxed at the 20% recreational discount and are open to the public for recreational purposes.

What happens when land is taken out of current use and is developed?

> Land which has been classified as open space land and assessed at current use values … shall be subject to a land use change tax when it is changed to a use which does not qualify for current use assessment. … the tax shall be at the rate of 10 percent of the full and true value determined without regard to the current use value of the land … such assessed value shall be determined as of the actual date of the change in land use … This tax shall be in addition to the annual real estate tax imposed upon the property, and shall be due and payable upon the change in land use.

What happens to the 10% penalty tax that is paid when the change in land use occurs?

At present, the "change of use" penalty tax (10% of the value of the land taken out of current use) goes into the Town's general fund. Many towns in New Hampshire put all or a portion of the penalty tax into a "conservation fund" so that the town can purchase land for conservation.

IV. NATURAL FEATURES AND DEVELOPMENT CONSTRAINTS

Understanding the constraints imposed upon development by key land characteristics serves as an invaluable tool for guiding the location and intensity of future development. This section examines the three major characteristics (soil conditions, slope conditions, and water resources) that limit development potential. It also designates certain natural features as *critical resources* (wetlands, Newfound Lake watershed, floodplains, and steep slopes).

A. <u>Soil Conditions</u>

Inadequate soil capability to absorb and treat septic effluent is a main cause of nutrient enrichment to lakes and ponds. Poor site planning can cause the contamination of private well waters by malfunction or failed septic systems. The *1985 Master Plan* contains a lengthy and detailed analysis of soils (see Appendix C). A more recent analysis of soil types can be found in a report written by the Lakes Region Planning Commission (LRPC) in 1993 at the request of the

Newfound Lake Region Association (NLRA). Copies of this report are available at Town Hall and at the NLRA offices.

Septic effluent technologies have changed and improved since the time of these reports, but soil types remain an important consideration with regard to road construction, foundations, stability, erosion, and sedimentation hazards. Under current subdivision regulations, it is the responsibility of the developer to prove that each lot is adequate to permit the installation and operation of both individual on-lot water and sewage systems.

B. Slope Conditions

Slope is measured and expressed as a percentage that represents the relationship between vertical and horizontal distance. Hebron slopes are depicted on the *Hebron Planning Map* (at the end of this chapter) according to degree of steepness as follows:

0 - 15%	white
15 - 25%	pale green
25 - 35%	medium green
Over 35%	dark green

Slopes can be further grouped into a three-level hierarchy based upon the capacity to support development. These groups are defined as follows:

Group 1: 0 - 15% has the least restrictions and consequently has the highest capability for development.

Group 2: 15 - 25% is a *critical resource* and has poor capability to support development.

Group 3: Over 25% is a *critical resource* not capable of supporting development.

It should be noted that land with a 0-3% slope may present development restrictions due to poor drainage or flood hazard. These factors are accounted for, however, through identification of wetlands and floodplains.

There are approximately 2,047 acres in Hebron with slopes greater than 25 percent, accounting for nineteen percent (19%) of the Town's total land area, and an additional 3,809 acres with slopes that range from 15-25 percent, accounting for another thirty-six percent (36%) of the Town's total area. Overall, approximately fifty-five percent (55%) or 5,856 acres in Hebron have significant degrees of development limitations based upon steep slopes and so are classified as a *critical resource*.

Steep slopes limit the natural capability of land to support development in two ways. First, land areas with steep slopes cause a higher volume and velocity of surface water runoff, increasing the likelihood for erosion. The resulting sedimentation affects both the immediate developed site and lower lying areas. Secondly, soil depth is thinner on steep slopes, decreasing the capacity of the land to filter septic system effluent.

Note: Current Hebron zoning regulations do not allow areas with slopes greater than 25% to fulfill the minimum lot size, but do allow structures to be built on slopes greater than 25%.

C. Newfound Lake Watershed

The Town of Hebron contains fourteen separate surface drainage areas, totally or partially within the Town. Each of these areas eventually drains into Newfound Lake and so are part of the Newfound Lake watershed. The *Hebron Planning Map* shows the Cockermouth River and the major streams (Cilley, Fretts, Wise, Tannery, and Georges/Bog brooks) that feed Newfound Lake. The Cockermouth River supplies 30% of the Newfound Lake water[2]. The surface waters of the river and streams, along with their associated drainage basins, are key components of the Newfound Lake Watershed and as such are a *critical resource* that must be protected.

Water quality is generally highest in the undeveloped, upland areas. It deteriorates as the water passes through more developed, downstream areas. "Inefficient" drainage networks (i.e., winding streams or wetland areas) tend to improve water quality. Man-made development, which alters the natural drainage and filtering of rainwater, can lead to increased soil erosion and can negatively affect water quality. When septic leachate or fertilizers enter the receiving waters,

[2] SOURCE: Newfound Lake Region Association

they can result in periods when the water has high levels of nutrients or the potential for pathogenic contamination.

Newfound Lake and Spectacle Pond are "public waters" and as such fall under the protection of the New Hampshire's *Comprehensive Shoreland Protection Act* (CSPA). The complete statute is available online at:

http://des.state.nh.us/cspa/

The CSPA protects land within 250 feet of public waters by establishing minimum distances from the shoreline to a primary structure (50 feet), regulating septic systems, and establishing and maintaining woodland buffers.

Neither the Cockermouth River nor any of Hebron's brooks and streams are protected under the CSPA because they do not come under the Act's definition of streams of "order four or greater". Over ninety percent of the people who responded to Hebron's *Community Survey* agreed that the quality of water resources, the protection of wetlands, and preservation of Hebron's shorelines is important. To protect watersheds, many towns in the Lakes Region have chosen to apply many of the strictures of the CSPA, or even stronger protection, to significant streams within their borders.

D. Floodplains

Floodplains are the periodically inundated flat lands adjacent to lakes, rivers and streams. Floodplains serve as storage areas for water during times of flooding and provide travel corridors for wildlife. Floodplains are a *critical resource*.

Due to their important ecological functions, development in floodplains presents some special problems, including: (1) a high probability of property damage during flooding; (2) the restriction of periodic water storage resulting in potentially greater flooding; and (3) the increased likelihood of erosion and sedimentation. The latter factor can cause increased turbidity of water in rivers and streams.

Floodplain soils in Hebron comprise approximately 306 acres or only 2.9 percent of the Town's total land area. The largest concentrations of floodplain soils are found along the Cockermouth River and in the area north of Cooper Road and south of George Road, where Fretts and Cilley Brook enter into Georges Brook.

Floodplains are delineated on the *Hebron Planning Map* (100-year flood plain data from National Flood Insurance Program, 2002).

Hebron's current zoning regulations allow new construction in floodplains as long as the construction meets certain standards. Hebron participates in the Emergency Phase of the Flood Insurance Program; flood insurance may be purchased for any structure and its contents. Many other towns in the Lakes Region prohibit new construction in flood plains.

E. Wetlands

New Hampshire RSA 482 defines a wetland as "an area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas." The statute goes on to state, in pertinent part:

> "It is found to be for the public good and welfare of this state to protect and preserve its submerged lands under tidal and fresh waters and its wetlands (both salt water and fresh-water), as herein defined, from despoliation and unregulated alteration, because such despoliation or unregulated alteration will adversely affect the value of such areas as sources of nutrients for finfish, crustacea, shellfish and wildlife of significant value, will damage or destroy habitats and reproduction areas for plants, fish and wildlife of importance, will eliminate, depreciate or obstruct the commerce, recreation and aesthetic enjoyment of the public, will be detrimental to adequate groundwater levels, will adversely affect stream channels and their ability to handle the runoff of waters, will disturb and reduce the natural ability of wetlands to absorb flood waters and silt, thus increasing general flood damage and the silting of open water channels, and will otherwise adversely affect the interests of the general public."

Hebron contains relatively few areas of wetland soils (see *Hebron Planning Map*). Most of the area is located in the central portion of the Town along the Cockermouth River where it enters Hebron Bay on Newfound Lake and adjacent to Georges/Bog Brook near Sanborn Bay on Newfound Lake. Wetlands comprise approximately 205 acres or about 1.9 percent of the Town's total land area. Wetlands are a *critical resource*.

F. Availability of Groundwater

Areas that have a significant potential to yield groundwater are called aquifers. An aquifer is a soil deposit, or sometimes a porous rock formation, that contains a recoverable volume of groundwater. Ease of recoverability is one of the most important aspects of an aquifer as it relates to development potential.

The U.S. Geological Survey data indicate that there are two potential aquifer areas in Hebron: a large area rated as having a medium to high potential to yield groundwater is located along the Cockermouth River from Hebron Bay to the Hebron-Groton town line, and a second area, which also has a medium to high potential, located in the north central part of town near Georges/Bog Brook. Because an aquifer is located in stratified deposits of sand and gravel, which are porous and transmit water rapidly, it is quite susceptible to pollution from septic system effluent, landfill refuse, salt runoff from roads, and fertilizers.

V. FUTURE LAND USE PLAN

A. Introduction

Although Hebron is small in land area, land is its basic resource. How its land is used will determine to a large degree the character and quality of community life. The rate, location, type of growth, and the extent of protection of unique resources directly affect not only the physical appearance of the community, but also the need for public services and facilities and their costs. Future land use will be decided by many individual decisions, as well as by decisions made by the community as a whole. People buy and sell land, cut woodlots, lumber forests, build homes, and establish businesses for personal economic reasons. The community establishes regulations controlling the use of land.

The Future Land Use Plan is a public guideline - a set of recommended policies. The Plan is developed from analysis of population demographics (see Chapter 1), citizen input through open meetings, community surveys, and focus groups (see Chapter 2), the Town's unique historic resources (see Chapter 5), protection of critical resources (see this chapter), and mitigation of natural hazards (see Chapter 4).

B. Zoning and Subdivision Regulations

The natural capability of the land to support development is the major consideration in designating future land uses. Given the rural and generally hilly nature of Hebron and the expressed wishes of the townspeople to maintain its rural character, low-density residential development is recommended as most appropriate. One significant way to achieve community goals and to implement the Town's Master Plan is through zoning ordinances. Hebron's current zoning districts (see *Hebron Zoning Map* and *Hebron Planning Map* at the end of this chapter) are defined as follows:

Common Historic District (CHD) – shall include all land within a radius of one-quarter (1/4) mile or thirteen hundred and twenty (1,320) feet of the benchmark located at the center of the Hebron Town Common.

Lake District (LD) – shall include all land between the shore of Newfound Lake and a continuous line drawn parallel to and five hundred (500) feet from the edge of the traveled portion of the off-lake side of the circumferential roads around Newfound Lake, excluding that portion of this area in the Common Historic District. These roads shall consist of the East Shore Road (Route 3-A) from the Bridgewater-Hebron town line to the junction with the North Shore Road, at McClure's Corner, so-called, the North Shore Road to the easterly bound of the Common Historic District, and the West Shore Road from the southerly bound of the Common Historic District to the Hebron-Bristol town line. This district shall also include all land within five hundred (500) feet of and perpendicular to the easterly edge of the traveled portion of Route 3-A for a distance of five hundred (500) feet along said easterly edge north from McClure's corner, so-called.

Rural District (RD) – shall include all the remaining land within the boundaries of the Town of Hebron.

Floodplain District – shall be an *overlay district* and shall include those areas within the Town which are delineated by the Federal Emergency Management Agency (FEMA) in its Flood Hazard Boundary Map of the Town of Hebron dated January 3, 1975 as amended or herein amended, which Map(s) are incorporated herein and which are on file in the Selectmen's Office.

Hebron's current zoning regulations further state that "the minimum area of any lot shall be at least one acre in size or larger depending on the soil and slope conditions as set forth in the Town Subdivision Regulations, Section VI, 6.1A through G, as may be suitable to sustain a sewerage disposal system." The Subdivision Regulations referred to above stipulate that "areas where the slope is greater than 25% may not be used to fulfill the minimum lot size", and "wetlands may not be used to fulfill any part of the minimum lot size." As noted earlier, regulations do not expressly prohibit building on areas with slopes greater than 25%. State regulations prohibit building in wetlands.

The current minimum road frontage for a lot is 150 feet; minimum frontage along lakes, rivers, and ponds is 100 feet. In accordance with the minimum standards of the *Comprehensive Shoreland Protection Act*, setback from the shores of "public waters" (Newfound Lake and Spectacle Pond) is 50 feet.

The *1985 Hebron Master Plan* recommended:

> "The hilly wooded terrain, Newfound Lake and the Village Common add a visual appeal and quality to the town that should be preserved, but could easily be damaged or lost through careless progressive scattering of small size lots. It would be very reasonable due to the town's rural character, its topography and lack of interior roads to require a larger minimum lot size, perhaps three to five acres in the more remote areas of the southwestern section (Bear Mountain), the area east of East Shore Road (Route 3A) and the northern section of town (Tenney Hill) west of George Road. For those individuals in search of rural country living, this would not be a limitation, but rather an assurance that the quality of the area will remain.
>
> The land area along Hebron's existing town and state roads is best suited for future residential development. Clustering of residential housing units in East Hebron near the intersection of East Shore Road (Route 3A), North Shore Road and Pike Hill Road, and along portions of Hobart Hill Road, as well as at other cautiously chosen locations, are suggested due to excellent soils and slope capability. Cluster development will permit preservation of open space allowing a greater sensitivity of the natural landscape features and provide more flexibility in street and lot layout."

These were excellent recommendations, but they were not put into effect through zoning changes. The minimum lot size requirements have not changed in the 20 years since the *1985 Master Plan* was accepted, and now there are developments based on the one-acre minimum spreading to areas of steep slopes.

The problem of the spread of housing developments to critical resource areas is not unique to Hebron. Other towns in the Lakes Region have strengthened their zoning laws to protect critical resource areas. The following population and land area data and excerpts from zoning regulations are from Lakes Region communities that have more stringent zoning regulations than Hebron:

TOWN	POPULATION IN 2000	LAND AREA IN SQUARE MILES	POPULATION DENSITY PERSONS PER SQUARE MILE
Hebron	459	16.9	28.1
Bridgewater	974	21.5	46.6
Sandwich	1286	91.2	14.2
Meredith	5943	40.3	150.1
Tuftonboro	2148	40.6	53.7

Bridgewater:

- Two-acre minimum lot size in General Residential District and Shoreland District; wetlands and slopes >15% may not be included in minimum lot size; the building coverage on any lot, including parking and driveway areas, shall not exceed 30% of any lot, with the open area devoted to landscaping and natural growth; minimum frontage on any street, lake or river shall be 150 feet.

- Five-acre minimum in Rural Residential District; each lot shall contain within the required lot size a minimum suitable site of 30,000 contiguous square feet which meets current NH Water Supply and Pollution Control Division standards; no slopes >30% shall be included; the minimum lot frontage shall be 300 feet.

Meredith:

- Three-acre minimum lot size in Forestry & Rural District; cluster requires three acres per dwelling;

- Ten-acre minimum in Forestry & Conservation Area; cluster by special exception provided that at least 50% is left as green or open space;
- 100 feet setback from brooks and streams.

Sandwich:

- 100,000 square feet (approximately 2.5 acres) minimum lot size;
- 260,000 square feet (approximately 6 acres) contiguous to and including the structure if the slope >15%; slopes in excess of 25% may not be included in the area to satisfy the minimum lot size requirement; isolated occurrences of steep slopes less than 15,000 square feet may be disregarded;
- No structures allowed in Skyline District; agriculture and silviculture only;
- 320 feet minimum lakefront shoreline; 125 feet septic setback from any lake, pond, stream or wetland'; 75 feet primary structure setback from road, 100 feet setback from lake, pond, wetlands;
- Cluster developments where steep slopes are involved allowed only after a formal environmental impact study is made by qualified professionals;
- At least 25% of any cluster development must be designated as permanent open space exclusive of road rights of way and parking areas.

Tuftonboro:

- Two-acre minimum in Low Density Residential District;
- Four-acre minimum in Open Space Forestry District.

In order to preserve wetlands, streams and brooks, maintain the water quality of the Newfound Lake watershed, minimize the effect of new development on the Town's natural scenic beauty and its pastoral atmosphere, and be in harmony with zoning ordinances in other Lakes Region communities, we recommend that the Town:

➢ **Support zoning changes that would limit development in areas of steep slopes and in or near wetlands and floodplains.**

To ensure adequate and safe housing for all residents, we recommend that the Town:

- **Determine the need for affordable housing, including senior housing, and if determined necessary, support zoning changes to ensure the availability of such housing.**

- **Determine the need for enhanced code enforcement services.**

C. Historic District and Historic Sites

Hebron, like many other small towns, offers a lifestyle and attitude that require few municipal services. Projecting the need for public building sites and facilities is highly dependent upon service demand, the condition and capacity of existing facilities, and the community's fiscal resources. In the years since the *1985 Master Plan* was accepted, Hebron has expended significant financial resources on a) the Bridgewater-Hebron School, b) the Bridgewater-Hebron Refuse Disposal facility, c) the Town Shed, and d) the Safety Building (recently completed). A new need, identified by the Community Survey and Focus Groups and articulated in the Vision Statement, is for a Community Hall, whether a new building or a renovated existing building, to provide space for civic, recreational, and cultural gatherings and needs.

The *1985 Master Plan* recommended, "Continue the inventory of historic structures and sites within the community." This work has been largely accomplished (see Chapter 5), but there is a need to find a permanent home for the collection of documents and photographs. We also endorse the recommendations concerning the Historic District and historic sites that emerged from the Community Survey and Focus Groups.

To enhance the Historic District and protect historic resources, we recommend that the Town:

- **Explore possible sites and designs for a Community Hall as soon as possible to avoid potential conflicts with other needs (for example, expanded cemetery space).**

- **Encourage preservation of historic documents, photographs, and artifacts, with public display of selected items.**

- **Establish a Heritage Commission under the purview of the Historic District Commission. Work with these commissions and local organizations to explore the feasibility and desirability of expanding the Historic District and protecting historic sites outside the District (for example, the Ordway and Ball home sites).**

- **Maintain public buildings in the Historic District. Enhance public grounds in the Historic District by replacing diseased trees with drought-tolerant varieties and by installing a watering system.**

D. <u>Conservation</u>

Maintaining open space, unimproved land areas that provide public and private enjoyment, is vital in maintaining Hebron's rural scenic asset. There are outlying land areas in Hebron that should be limited in their development in the future and kept reasonably intact as forested open space. These land areas include the mountainous area of Hobart Hill and Bear Mountain in the southwesterly portion of the town, the area from Tenney Hill northward in the north central section of town, and the steep area located easterly of East Shore Road. The *1985 Master Plan* designated these areas as "conservation/environmental protection areas" and said that they "should be used primarily for forestry, conservation, and recreation."

The *1985 Master Plan* further stated, "that a green belt be maintained along the shores of Newfound Lake and along all streams feeding into the lake for purpose of protecting water quality and the rural environment," and that "landowners be encouraged to seek forestry expertise to develop a forest management plan for any area that will be logged."

The Society for the Protection of New Hampshire Forests document, *Protected Lands 2004*, ranks each New Hampshire town in terms of what percentage of its land is protected. The Forest Society's NH Everlasting goal (NHE) is to see 25% of each town protected by the year 2025. The current statewide average is 27.8% protected[3]. According to data obtained from the NH

[3] The White Mountains National Forest 's 794,400 acres is largely responsible for this high statewide percentage.

GRANIT database maintained by the Complex Systems Research Center (CSRC) at UNH, Hebron currently has only 303 acres (2.8%) protected, ranking it 239th out of the 279 communities listed.

To maintain the rural quality of the Town so valued by its residents and to minimize the effect of development on the Town's natural scenic beauty and pastoral atmosphere we recommend that the Town:

- **Encourage land trusts, conservation groups, and private and municipal landowners to hold forests, shoreline, and open space for conservation and public recreational uses, as appropriate, and promote the use of conservation easements and restrictions for these purposes.**

- **Create a reserve fund, partially funded by change-of-use penalties, for purchasing conservation land.**

- **Develop an Open Space Subdivision ordinance that would require developers to retain a significant portion of the development for open space/conservation easements.**

- **Create a Hebron Town Forest.**

- **Using the *Comprehensive Shoreland Protection Act* as a guide, develop ordinances to protect the Cockermouth River, the major brooks (e.g. Cilley, Fretts, Wise, Tannery, and Georges/Bog brooks) and wetlands.**

To help maintain Hebron's rural character, to prevent further reduction of visibility of the night sky, and to reduce annoying lighting conditions, we recommend that the Town:

- **Adopt a lighting ordinance in conformity with the "Dark Sky" guidelines of the New Hampshire Office of Energy and Planning Technical Bulletin 16[4].**

E. <u>Recreation</u>

The Town of Hebron depicted in the *1985 Master Plan* had limited need for public land holdings or public recreation facilities for its residents. Because of its

[4] http://nh.gov/oep/resourcelibrary/TechnicalBulletins.htm

small population and extensive rural countryside most people pursued recreation in an unorganized way. The Town Common, the Memorial Beach, the Audubon sanctuaries, the Charles L. Bean Sanctuary, and the snowmobile trails provided then, as they do now, recreational opportunities to Hebron citizens. In recent years, the popular summer gazebo programs have added greatly to the recreational, cultural, and social life of the community. As the population of the Town has grown, however, the desire for expanded recreational opportunities both for families with young children and for retirees has grown with it. Suggestions for expanded recreational facilities include: a) biking, jogging, and walking paths; b) horseshoe pits and volleyball courts on the Town-owned Rogers' property; c) expanding use of the Town beach for residents; and d) creating a municipal ice skating rink off the Town beach. Public facilities should be reviewed on an annual basis to determine if improvements are necessary.

To address the need for expanded recreational opportunities we recommend that the Town:

- **Expand recreational facilities on Town-owned lands.**
- **Work with land trusts, and with private and municipal landowners to create linking trail networks.**
- **Work with landowners to explore the possibility of a "river walk" along the Cockermouth River.**
- **Encourage landowners and organizations to maintain lanes for four-season multi-use trails along Class VI roads.**

F. Roads

Other suggestions have focused on the need to continuously evaluate the transportation network to identify needed maintenance and improvements, and to promote safe bicycle and pedestrian avenues throughout the Town. For example, there is need for safer guardrails on West Shore Road along the ledges south of the Hebron town line. (See *Chapter 4 – Natural Hazards*)

To improve road safety, we recommend that the Town:

- **Work with the New Hampshire Department of Transportation to make improvements on NH 3A, North Shore Road, West Shore Road, and Groton Road to improve vehicular and pedestrian safety.**

- **Maintain and upgrade town roads in keeping with the scenic and historical character of the Town. Add shoulders for safer travel and recreation.**

G. Town, Regional, and State Cooperation

No town, and in particular no town as small as Hebron, can rely solely on its own human resources in developing and implementing plans and regulations designed to protect the quality of life and actualize the vision of its townspeople. It must maintain an active role in regional and state land use planning activities and provide local enforcement of federal, state and town land use regulations pertaining to forests, wetlands, floodplains, water quality control, and community appearance. It also must take proper and timely action against violators of existing codes, regulations, and ordinances and regularly publish updated regulations and ordinances as printed documents and as pages on the Town of Hebron website:

www.hebronnh.org

H. Communications

The newly established Town of Hebron web site has added greatly to the Town's ability to publish documents and public notices and to communicate with residents and non-residents.

To strengthen communications, we recommend that the Town:

- **Post all public notices and related agendas on the Town of Hebron web site. This would not be a substitute for statutory notice.**

- **Publish a calendar of events and minutes of public meetings on the Town of Hebron web site.**

- **Publish notices of events and meetings on the local free cable TV channel.**

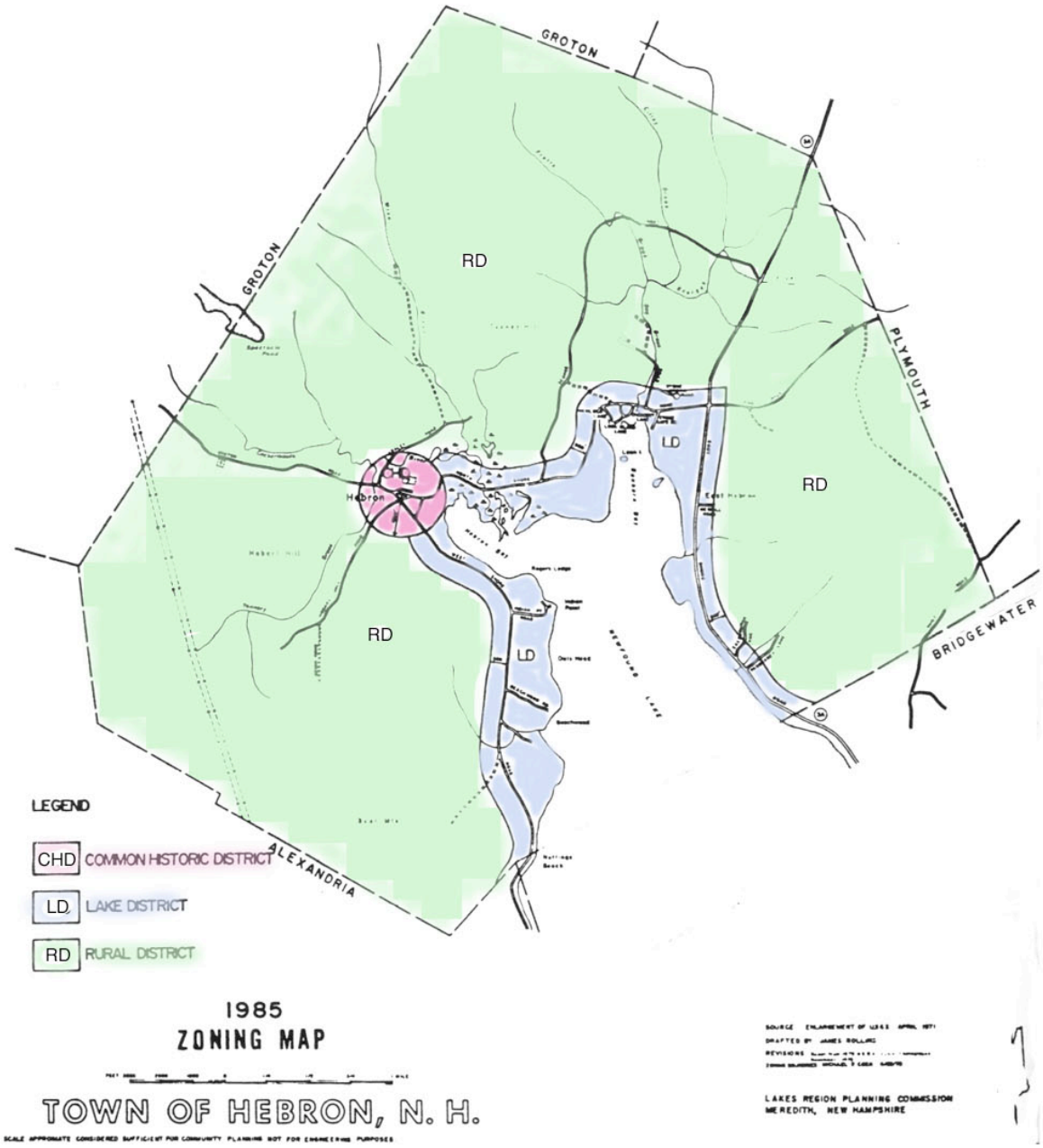
- **Continue its practice of holding a summer informational town meeting to better include nonresidents and part-time residents in the civic life of Hebron.**

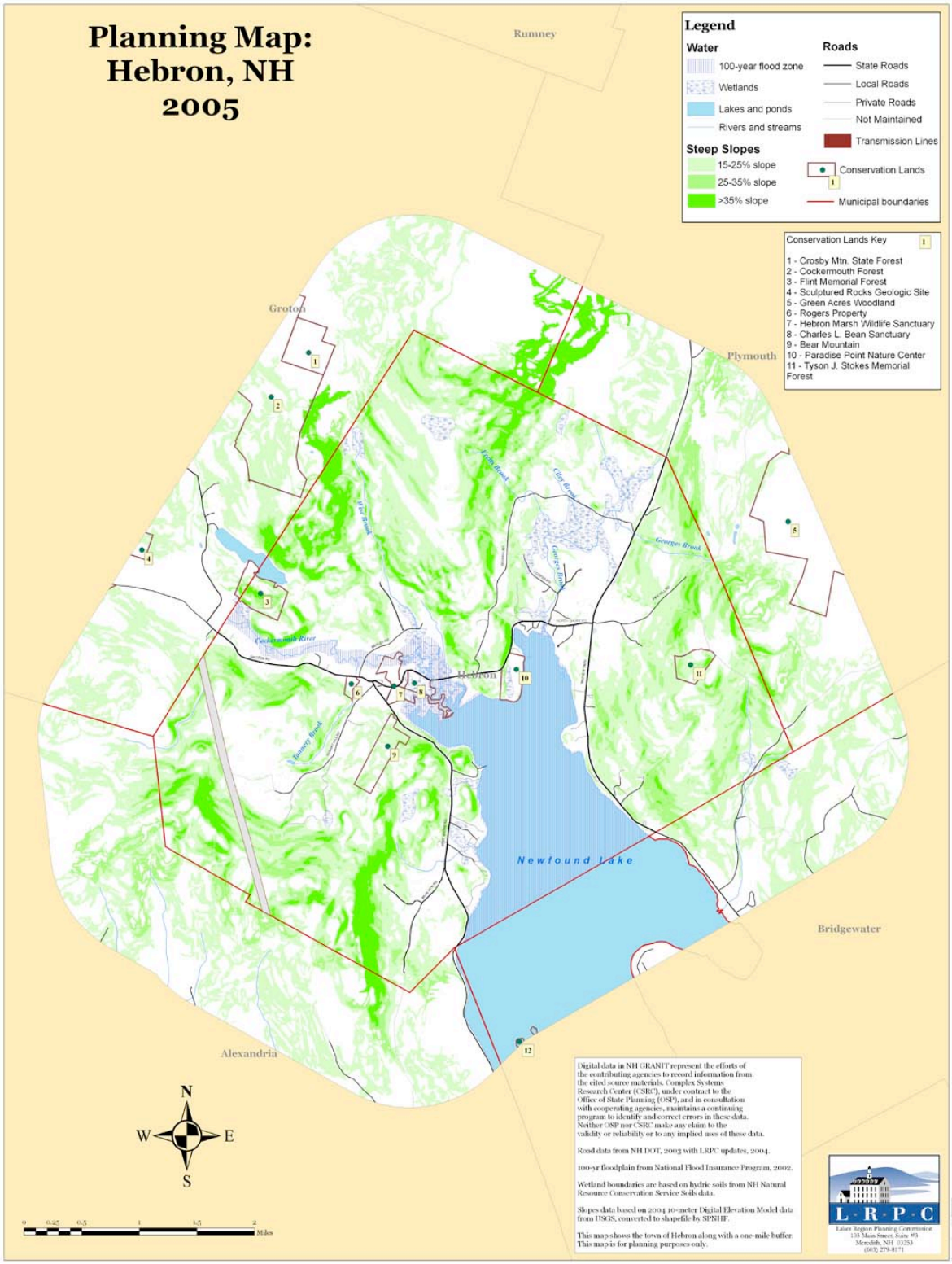
VI. PLAN ACCEPTANCE AND IMPLEMENTATION

This Master Plan report provides a framework to guide the actions of local government agencies, as well as the individual citizen and developer, while respecting the relation of individual rights to community interests. In order for the Master Plan to be effective, it must not only have the acceptance and continued supervision of the Planning Board, but also must be supported through general citizen knowledge of planning policies. A Master Plan is just a piece of paper unless its recommendations are accepted by the citizens of the Town and implemented by ordinances that honor both community and individual welfare.

Twenty years have elapsed since the writing and acceptance of the *1985 Master Plan*. Over the years, the document and the vision and recommendations that informed it had faded from memory and into disuse. It is important to understand that a master plan *recommends*, and that these recommendations directly relate to the town's Capital Improvement Program (CIP), a document guiding budget planners in the community. Note that *implementation* of the goals and objectives of the master plan can be brought about only through organizations of the townspeople and through our democratic town meeting system. The Planning Board must coordinate with other town boards and civic organizations, and above all, it must have the citizens' support at the time action is necessary in carrying out various facets of the Master Plan in order to realize a better Hebron.

A master plan is flexible in nature and should be reevaluated regularly and updated at least every five years as new trends and needs are recognized.
The Planning Board needs to commit to an annual review of the Plan, with updates motivated by community input.


GROTON
GROTON
PLYMOUTH
BRIDGEWATER
ALEXANDRIA
RD
RD
RD
LD
LD
CHD
Hebron
LEGEND
CHD COMMON HISTORIC DISTRICT
LD LAKE DISTRICT
RD RURAL DISTRICT
1985
ZONING MAP
TOWN OF HEBRON, N. H.
LAKES REGION PLANNING COMMISSION
MEREDITH, NEW HAMPSHIRE


Planning Map:
Hebron, NH
2005
Legend
Water
100-year flood zone
Wetlands
Lakes and ponds
Rivers and streams
Steep Slopes
15-25% slope
25-35% slope
>35% slope
Roads
State Roads
Local Roads
Private Roads
Not Maintained
Transmission Lines
Conservation Lands
Municipal boundaries
Conservation Lands Key
1 - Crosby Mtn. State Forest
2 - Cockermouth Forest
3 - Flint Memorial Forest
4 - Sculptured Rocks Geologic Site
5 - Green Acres Woodland
6 - Rogers Property
7 - Hebron Marsh Wildlife Sanctuary
8 - Charles L. Bean Sanctuary
9 - Bear Mountain
10 - Paradise Point Nature Center
11 - Tyson J. Stokes Memorial Forest
Rumney
Groton
Plymouth
Hebron
Bridgewater
Alexandria
Newfound Lake
Cockermouth River
Fowler Brook
Elliot Brook
Georges Brook
Ramsey Brook
N
W
E
S
0 0.25 0.5 1 1.5 2 Miles
Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center (CSRC), under contract to the Office of State Planning (OSP), and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. Neither OSP nor CSRC make any claim to the validity or reliability or to any implied uses of these data.
Road data from NH DOT, 2003 with LRPC updates, 2004.
100-yr floodplain from National Flood Insurance Program, 2002.
Wetland boundaries are based on hydric soils from NH Natural Resource Conservation Service Soils data.
Slopes data based on 2004 10-meter Digital Elevation Model data from USGS, converted to shapefile by SPNHF.
This map shows the town of Hebron along with a one-mile buffer. This map is for planning purposes only.
L·R·P·C
Lakes Region Planning Commission
103 Main Street, Suite #3
Meredith, NH 03253
(603) 279-8171

Chapter 4

NATURAL HAZARDS

I. INTRODUCTION

In 1991 the Hebron Board of Selectmen appointed a Hazard Mitigation Planning Committee (HMPC) who, with the assistance of the Lakes Region Planning Commission (LRPC), worked to develop a hazard mitigation plan. The full *Hebron Hazard Mitigation Plan* was accepted in 1992 and is available at the Town Hall. The sections of the plan that relate most closely to land use are included in this chapter.

> "Natural hazard mitigation planning is the process of figuring out how to reduce or eliminate the loss of life and property damage resulting from natural hazards such as floods, earthquakes, and tornadoes."

The planning process involves understanding vulnerability (what is open to damage) and risk (possibility of loss) and creating a plan to reduce the potential for loss. Working with the list of natural hazards affecting New Hampshire, provided in *Hazard Mitigation Planning for New Hampshire Communities*, the Hebron Hazard Mitigation Planning Committee (HMPC) addressed those hazards in which the community has suffered losses in the past. Based on historical events and local knowledge of the community the HMPC identified the following hazards, which serve as the focus of this plan: 1) flooding; 2) forest fires; and 3) winter storms including both ice and snow.

The average temperature in the Hebron area varies from 19.7 degrees Fahrenheit in January to 70.0 degrees Fahrenheit in July. The average annual precipitation is 42.0 inches. New Hampshire is in a 160-mph wind zone; the majority of the southern half of the State of New Hampshire (including all of Grafton County) is located in a hurricane susceptible region. While all hazards represent a potential threat to the community, the frequency of occurrence and the potential for damage were the leading factors that ranked flooding, forest fires, and severe winter weather of greatest concern to the community.

II. TOWN OF HEBRON MITIGATION GOALS

- To improve the level of protection of the health, safety, and wellbeing of all Hebron community members.
- To maintain and improve the existing emergency response system.
- To reduce the potential impact of natural and man-made disasters on public and private property in the community.
- To gain a greater understanding of the alternatives available for the implementation of cost-effective hazard mitigation opportunities.
- To work in cooperation with the State of New Hampshire's Hazard Mitigation goals.
- To maintain compatibility with the goals of the Master Plan.

III. NATURAL HAZARDS RISK ASSESSMENT

The NH Office of Emergency Management (OEM) has identified vulnerabilities to natural hazard events generalized on a county by county basis for the state as shown in the table below for Grafton County. The table represents the many natural hazards that may occur in any area and ranks them according to high, moderate, low, or no vulnerability. Many of these hazards impact large geographic areas and will effect multiple communities or entire regions of the State.

TABLE 4-1

Grafton County Natural Hazards Vulnerability

Natural Hazards	***High***	***Moderate***	***Low***	***None***
	Flood	Drought	Subsidence	Storm Surge
	Wildfire	Extreme Heat	Hurricane	Tsunami
	Nor'Easter	Earthquake	Avalanche	
	Heavy Snow	Landslide		
	Ice Storms	Radon		
		Downburst		
		Lightning		
		Hail		

Source: New Hampshire Office of Emergency Management

Individually, communities may incur greater losses due to hazardous events based on topography and other physical characteristics, land use, building codes, and zoning.

As a starting point for defining hazard mitigation strategies, the HMPC used the above list of Grafton County hazards in the vulnerability table to evaluate and rank the most significant hazards for the Town of Hebron. The goal was to create a more limited list of specific hazards for which the Town could begin hazard planning. The Town of Hebron Risk Assessment Matrix was developed based on historical references to hazard events, and community knowledge of the difficulties encountered in dealing with various hazards.

TABLE 4-2

Town of Hebron Risk Assessment Matrix

Flooding	3
Woodland Fires	3
Severe Winter Weather	3
Earthquake	2
High Wind Events	2
Lightning	1
Drought	1
Radon	1
Hail	1
Extreme Heat	1

The hazards were ranked on a scale of 1-3 as follows: 1 (low risk), 2 (moderate risk), and 3 (high risk). Ranks were determined by adding a point for each of the following three criterion: magnitude, frequency and area impacted. For example, woodland fires are rated a 3 in the assessment matrix, one point for each of the three criteria. Woodland fires compared to other hazard events, are of greater magnitude (magnitude = 1 point) and occur relatively more frequently (frequency =1 point), and while massive wildfires are uncommon in Hebron, more than 80% of Hebron is wooded, thus the potential impact area is vast (area impacted = 1 point). In contrast, drought ranked only one point for the area impacted because when droughts occur in the northeast the effects are widespread. However, the Town is not dependent on water for large agricultural uses, snow making, or other high water consumption industries and, compared to other hazards the frequency of a drought event was considered to be low.

It should be noted, that the ranking of individual hazards for planning purposes should not in any way diminish the potential severity of the impact of any given hazard event. Further, hazards ranked as low risk may have the impact of increasing the risk of other hazards when they occur. For example, in the event of a drought, the risk of a woodland fire may be greater. The following describes in more detail past and potential future hazard events and the vulnerability for each of the high and moderate hazards identified in the risk table.

A. Flooding - High Risk

Specific areas of concern- Cockermouth River, Georges Brook, "The Flats", FIRM Identified Floodplain, Steep Slopes.

Hebron has participated in the National Flood Insurance Program (NFIP) since 1975. There are currently five properties located in the floodplain and four property owners in the community that carry NFIP policies. There has been one claim filed since 1978 for flood related damages, for which NFIP paid a total of $19,816. There have been no repetitive losses in Hebron.

Both the Cockermouth River and Georges Brook have been subjected to perennial and flash flooding that has resulted in road closures, varying degrees of erosion, and loss of property use. The flooding on these watercourses can occur at any time of the year and is typically caused by periods of heavy rainfall or excessive snowmelt. The HMPC has delineated specific areas of concern on these watercourses and the locations of past flooding events, as indicated on the Potential Fire and Flooding Hazards Map (in full *Hazard Mitigation Plan* document).

Concern about flooding on the Cockermouth led to the Town purchase of land adjacent to the Braley Bridge in the 1950's. At that time, work was undertaken to restore the meandering river to its historic course. Later in 1973 the Town obtained a wetlands permit to maintain approximately 1.5 miles of the river upstream of the Braley Bridge. In the 1990's flooding increasing in frequency and in magnitude has led to the loss of road access in the area of North Shore Road called "The Flats". In periods of heavy rain and or snowmelt this low-lying section of the North Shore Road is completely covered with as much as two feet of water.

In the upper reaches of Georges Brook, the steep slopes that funnel water through the brook greatly increase the velocity of flow east of NH Route 3A. During storm events the volume of flow had been too great for the box culvert beneath NH Route 3A to handle, so the New Hampshire Department of Transportation reconstructed the culvert on NH Route 3A to handle the excess flow. A State Hazard

Mitigation Grant was used in 2001 to replace the box culvert on Georges Road. As recently as 1998, emergency response vehicles have been prevented from passing due to road flooding. Changes in the watercourse on the lower reaches of Georges Brook have resulted in loss of property use where farm fields have remained consistently wet and impassible by tractor.

B. Other Flooding Concerns

The HMPC identified areas on the Cockermouth River and Georges Brook where beaver damming has been a persistent problem for property owners. The active beavers have effectively stopped culverts, affecting drainage and stream flow, which has resulted in the change of stream course and loss of productivity of farmlands. As a result of this activity those lands remain habitually flooded. Action is being taken to trap and remove the beavers. It is suggested that after removal, the existing beaver dams should be removed. As a result of heavy rainfall over a prolonged period of time, a committee member reported that the Newfound Lake waters have recently risen five feet over the course of several hours. The result of the rapid rise was that boats were torn from their moorings and docks. Many boats were overturned, causing fuels to be introduced into the lake. Another concern expressed by HMPC members is the amount of debris that is located in the streams and along stream banks. The debris is in part a result of the beaver activity, but is also noted in areas absent of active beavers. The concern is that the debris can significantly reduce the natural capacity of the stream and increase the magnitude of flooding and the number of areas prone to flooding.

New Hampshire Department of Environmental Services (NH DES) lists three dam sites in the town of Hebron, all of which are rated Class AA, non-hazardous structures. Class AA dams are those structures in which a dam failure would not threaten life or property. The NH DES, Water Division, on six-year intervals, inspects dams of this classification. After inspection the dam owner is requested to complete any repairs needed to maintain the dam in safe working order. The HMPC felt it important to recognize these dams and their ongoing inspections.

TABLE 4-3

Class AA Dams in Hebron

Dam Name	Height	Length	Impoundment Area
Jackson Pond Dam	6'	50'	.10 acres
Spectacle Pond South Dike	5'	110'	58 acres
Tannery Brook	12'	100'	0.30 acres

Given the prevalence of moderate and steeply sloped land in Hebron and the rate of residential development in recent years, efforts should be taken to avoid intensifying the flood potential in flood sensitive areas within the community. Both steep slopes and special flood hazard areas are currently addressed in the Town of Hebron Subdivision Regulations. Soils-based lot sizing for sloped developments and storm water management plans both have the ability to help minimize the impact of increased runoff due to development. Careful monitoring of the impacts of future development on flood sensitive areas is warranted.

C. Woodland Fires – High Risk

Specific areas of concern: Town-delineated limited access areas, future development in woodland areas.

The HMPC identified the steep wooded slopes shown on the *Potential Fire and Flooding Hazards Map* (in full *Hazard Mitigation Plan* document) as areas where the lack of road access makes fire fighting difficult. Because significant debris remains in the woods from the ice storm in 1998, fire danger is greatly increased. A 1998 lightning strike on Hobart Hill caused a four-acre fire that was fought by local fire fighters over a one-week period of time. State Grants for mitigation projects have been used to open Wade Road (to Hunt Road), Stokes Road, Veasey Road (to Hobart Hill), Cilley Road, and Tenney Lane to increase fire-fighting capacity. The Town has also used grant funding for the purchase of woodland fire-fighting equipment. These unimproved roadways represent important, and in many cases, the only access corridors for use in the event of woodland fire. A community commitment towards insuring that these access ways remain unobstructed may aid in minimizing losses associated with woodland fires by preserving fire-fighting accessibility.

Another area of potential concern are developments in close proximity to large tracts of woodland. Known as urban wildfire interface, vulnerability to fire can be greatly reduced by requiring developments to establish readily accessible water sources for fire suppression if non existent on site. Firebreaks act to prevent damage to buildings and timber stands from fire as well. Firebreaks consist of a strip of mowed grass or fire-retarding vegetation that provide a natural barrier between developed areas and timber stands. The need for added fire protection measures can be addressed through the Planning Board in the site plan review

process, by allowing the Fire Chief to provide comment on development proposals in close proximity to inaccessible or limited access timber stands.

While historically massive wildfires have been a Western phenomena, each year hundreds of woodland acres burn in New Hampshire. The greatest risk exists in the spring after the snow has melted and before the tree canopy has developed and in the late summer/early fall. Appropriate planning can significantly reduce a community's vulnerability to woodland fires.

D. Severe Winter Weather – High

Specific areas of concern: Town-wide, elderly population, critical facilities

As in all New Hampshire towns, Hebron is susceptible to extreme winter weather, including heavy snow, ice storms, and extreme cold. The Town's aging population and its rural setting put it at greater risk from extreme winter weather. A leading concern with winter storms is the potential for long periods of power outage. It was generally agreed that enhancing existing facilities could provide a greater level of community aid during winter events.

New Hampshire generally experiences one or two Nor'Easters with varying degrees of severity each year. These storms have the potential to inflict more damage than many hurricanes because high winds can last from 12 hours to 3 days, while the duration of a hurricane ranges from 6 to 12 hours. Infrastructure, including critical facilities, may be impacted and power outages and transportation disruptions are often associated with these events. In the winter months, the State may experience the additional coincidence of blizzard conditions with many of these events. The added impact of the masses of snow and/or ice upon infrastructure often affects transportation and the delivery of goods and services for extended periods of time.

Other areas of concern regarding snow and ice are the ledges on West Shore Road. Here the road narrows as it passes by the Lake and some very prominent rock ledge. This stretch of road has been subjected to falling snow pack and ice in the past. West Shore Road serves as a primary access route in Hebron. The ledges represent a potential hazard for motorists passing by and the potential exists that the roadway could become blocked as it has in the past.

Given the relative frequency of severe winter weather in the Northeast, great pride is taken in the availability of equipment and manpower to clean up after these

events. Equally as important as an expeditious recovery from severe winter events is the need for adequate safety during and after the event. Safety factors include the identification/provision of emergency fuel supplies, adequate power generation and structurally sound critical facilities, and the ability to communicate among all Town departments and to residents in the more remote areas in the community.

IV. EXISTING POLICIES AND REGULATIONS

The Town of Hebron has a variety of mitigation policies and regulations in place that protects people and property from natural hazards.

1. **Zoning Ordinance**: National Flood Insurance Program (NFIP) requirements have been adopted in the Town's zoning ordinance. The current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) were revised May 18, 1998.
2. **Emergency Preparedness Plan**: The Town maintains an Emergency Preparedness Plan.
3. **Permits System**: The Town has an "intent to build'' permit system that is administered by the Board of Selectmen. Though no official building codes have been adopted, application review affords the Town the ability to take hazards into consideration prior to construction.
4. **Emergency Power Generation**: Emergency power generation exists in the fire station; this source additionally supplies emergency power to the Congregational Church. Both facilities have been identified as critical facilities.
5. **Hazard Mitigation Grant Program**: The Town has applied for and received past Hazard Mitigation Program Grants.
6. **Subdivision Regulations**:
    - Contain soil-based lot size requirements for subdivision of sloped land, which aids in minimizing the impact of development in terms of storm water management, erosion, and potential flooding.
    - Identify and further restrict the subdivision of land in the delineated special flood hazard area.
    - Limit the grade of roads to 10 percent, unless the Board of Selectmen and the Planning Board grant approval.
7. **Site Plan Regulations**:
    - Require the site plans to contain surface water locations and surface and subsurface drainage facilities. This information can be useful in making determinations regarding on-site and off-site flooding issues and the availability of fire protection measures.

V. HMPC RECOMMENDATIONS

Hazard mitigation planning should be ongoing in Hebron. The following long-term recommendations will require additional study:

1. Coordination with the State to gain a better understanding of water level controls on Newfound Lake and early warning measures that could be taken to minimize property and environmental damage caused by rapid rises in water levels.
2. Identification of actions that could be taken by the Town and owners on property in the floodplain that would reduce the potential for property and environmental damage caused by future hazard events.
3. Monitoring and further assessment of the impacts and solutions for flooding that causes road closures in the areas identified in the flood hazard section of this plan.
4. Coordination with the Planning Board to ensure all opportunities to address erosion control, fire access and prevention measures, and storm water management are being addressed for future development occurring in sloped and woodland areas.
5. Consideration given to the benefits of establishing a building code as it relates to reductions in potential future property damage caused by natural hazards.
6. Further analysis of building vulnerability to hazards which may include a critical facilities snow load assessment and general safety assessment addressing such issues as the placement of propane tanks, outdoor electrical wires, etc.
7. Creation of a natural hazards chapter in the Master Plan. Adoption of this plan by the Planning Board could provide the basis for a Master Plan mitigation chapter that would support planning efforts as future development occurs.
8. Subdivision regulations and zoning ordinances can be enhanced to include fire and flood hazard mitigation requirements.
9. Implementation of this Plan's mitigation goals could possibly be linked to the costs of future development through the Town's Capital Improvements Program (CIP) and impact fee schedule. For example, with an impact fee schedule, the improvement of a class VI road for fire fighting accessibility that has been identified in the CIP, increases the potential to collect for off-site improvements.

Chapter 5

HISTORICAL RESOURCES

I. INTRODUCTION

History is a process - it is being made even as it is written. History is more than the simple recalling of events - it summons new and varied interpretations as people seek to make sense of their current predicaments.

Historical interpretation can be used as a mirror to the future. The natural setting and human spirit that has been unique to Hebron should be used as a guide for its future. The Master Plan is one method of helping to recognize and to carry on the best traditions of the Town. A plan for the future, however, without a look back at the past, is incomplete.

The visual evidence of Hebron's early character and appearance, particularly Hebron Village, contributes significantly to the Town's current appeal and character, adding personality and a sense of place.

The identification and conservation of Hebron's built environment can be used as an important community development instrument, especially in terms of evaluating future community planning and development proposals. The preservation of noteworthy architectural styles and buildings of historical importance helps keep the Town's rich heritage in clear view, as today's public officials and decision makers confront a variety of planning and development problems and opportunities.

II. NATIONAL REGISTER HISTORIC DISTRICT

The National Register of Historic Places is a list of districts, sites, buildings, structures, and objects that are significant in American History, architecture, archaeology, engineering, and culture. Locally, the National Register program is administered by the State of New Hampshire Historic Preservation Office in partnership with the U.S. Department of the Interior's National Park Service.

The National Register is primarily a tool for identifying and planning the future of significant historic resources. It not only provides national recognition of local resources, but also helps to develop an appreciation of these special resources by the town and can foster similar preservation efforts in other parts of the community.

In 1983 the Lakes Region Planning Commission successfully nominated Hebron Village to the National Register of Historic Places as a National Register Historic District.

III. THE HISTORICAL RESOURCES INVENTORY

The Historical Inventory of Hebron consists of houses, barns, a bridge, a road and home sites of historical significance. A list of items in the inventory, photos of the historic houses, and a map to help locate the old houses are included in this chapter of the Master Plan. A full description of each of the items and historical information may be found in the *Historical Inventory of Hebron, NH*, by Ronald W. Collins, President & Archivist, Hebron Historical Society.

Extant Historical Home Inventory

House Builder	Date Built
Rueben Hobart	c1782
Uriah Pike	c1782
George Worthen	c1784
Jonathan Morse	c1784
Abijah Wright	c1785
Samuel Hazelton	c1790
Daniel Pike	c1791
John Hazelton	c1798
Jonathan K. Pike	c1803
Samuel Crosby	c1813
Enos Ferrin	c1820
Daniel Walker	c1835
Samuel Noyes House	c1840
The Parsonage	c1840

Extant Historical Barn Inventory

Barn Builder	Date Built
Jonathan Morse	c1803
George Smith	1907

Historical Bridge Inventory

Braley Road Bridge built c1927

Historical Road Inventory

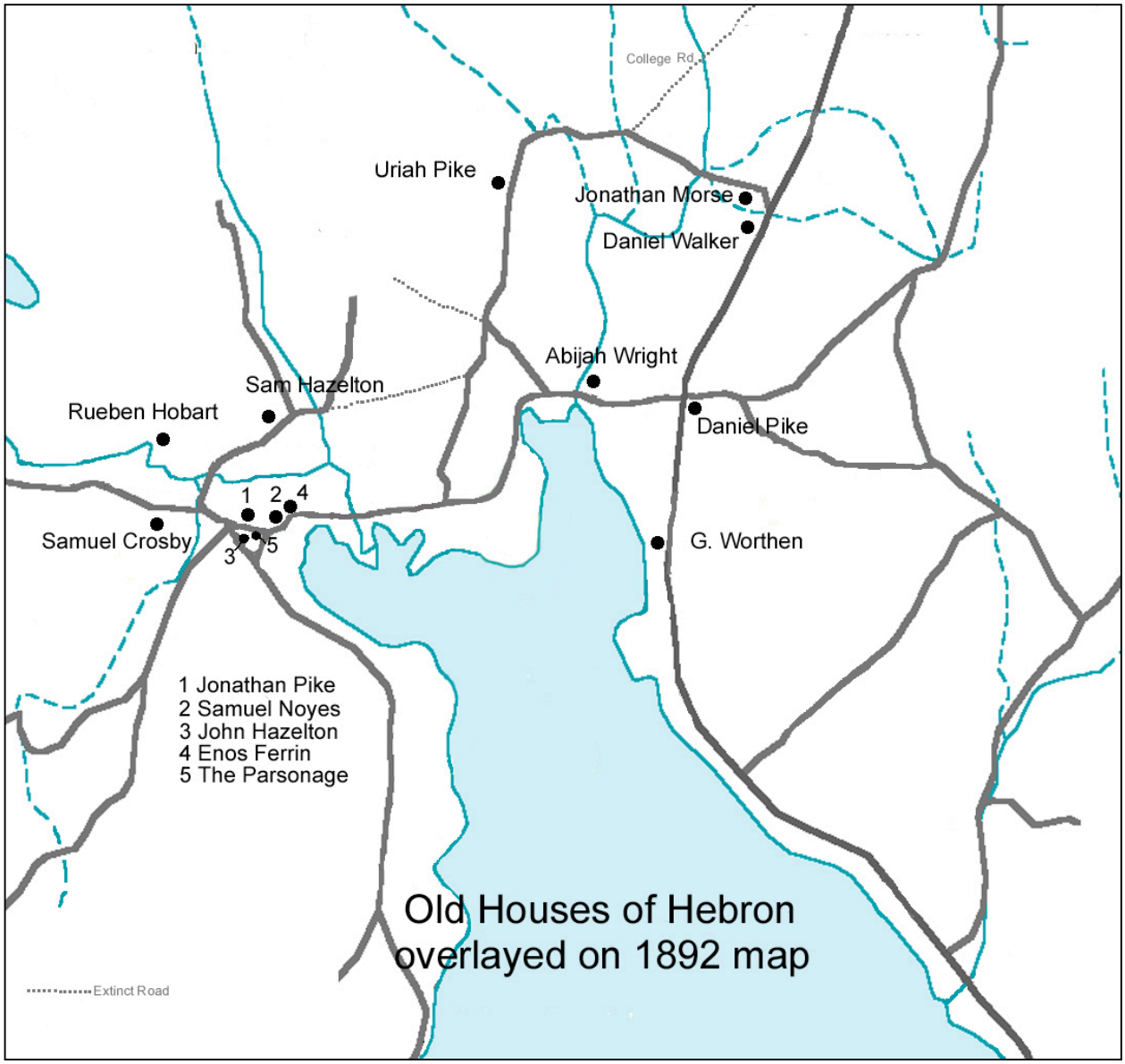
College Road built c 1772

Historical Home Site Inventory

Family	*Historical Significance*
Nathaniel Ball	Cousin to George Washington; father of John Ball founder of Grand Rapids, MI and Portland, OR; father of Deborah Ball Powers, first self made millionairess in the US.
Stephen Ordway	Brother to Sergeant John Ordway, who was 3rd in command of the Lewis & Clark Expedition.
Nathaniel S. Berry	Governor of New Hampshire during the Civil War and advisor to President Abraham Lincoln

Historical Camps

Camp Pasquaney	1893	Oldest continuously operated boys camp in the United States
Camp Onaway	1900 as Camp Redcroft	Oldest operating girls camp in the United States
Camp Mowlis	1903	


College Rd
Uriah Pike
Jonathan Morse
Daniel Walker
Abijah Wright
Sam Hazelton
Rueben Hobart
Daniel Pike
1
2
4
Samuel Crosby
3
5
G. Worthen
1 Jonathan Pike
2 Samuel Noyes
3 John Hazelton
4 Enos Ferrin
5 The Parsonage
Old Houses of Hebron
overlayed on 1892 map
Extinct Road

Rueben Hobart House c1782

Uriah Pike House c1782

George Worthen House c1784

Abijah Wright House c1785

Samuel Hazelton House c1790

Daniel Pike House c1791

John Hazelton House c1798

Jonathan K. Pike House
c1803

Jonathan Morse House
c1784

Samuel Crosby House c1813

Enos Ferrin House (Meadow Wind) c1820

Daniel Walker House c1835

Samuel Noyes House c1840

The Parsonage c1840

Jonathan Morse Barn c 1806

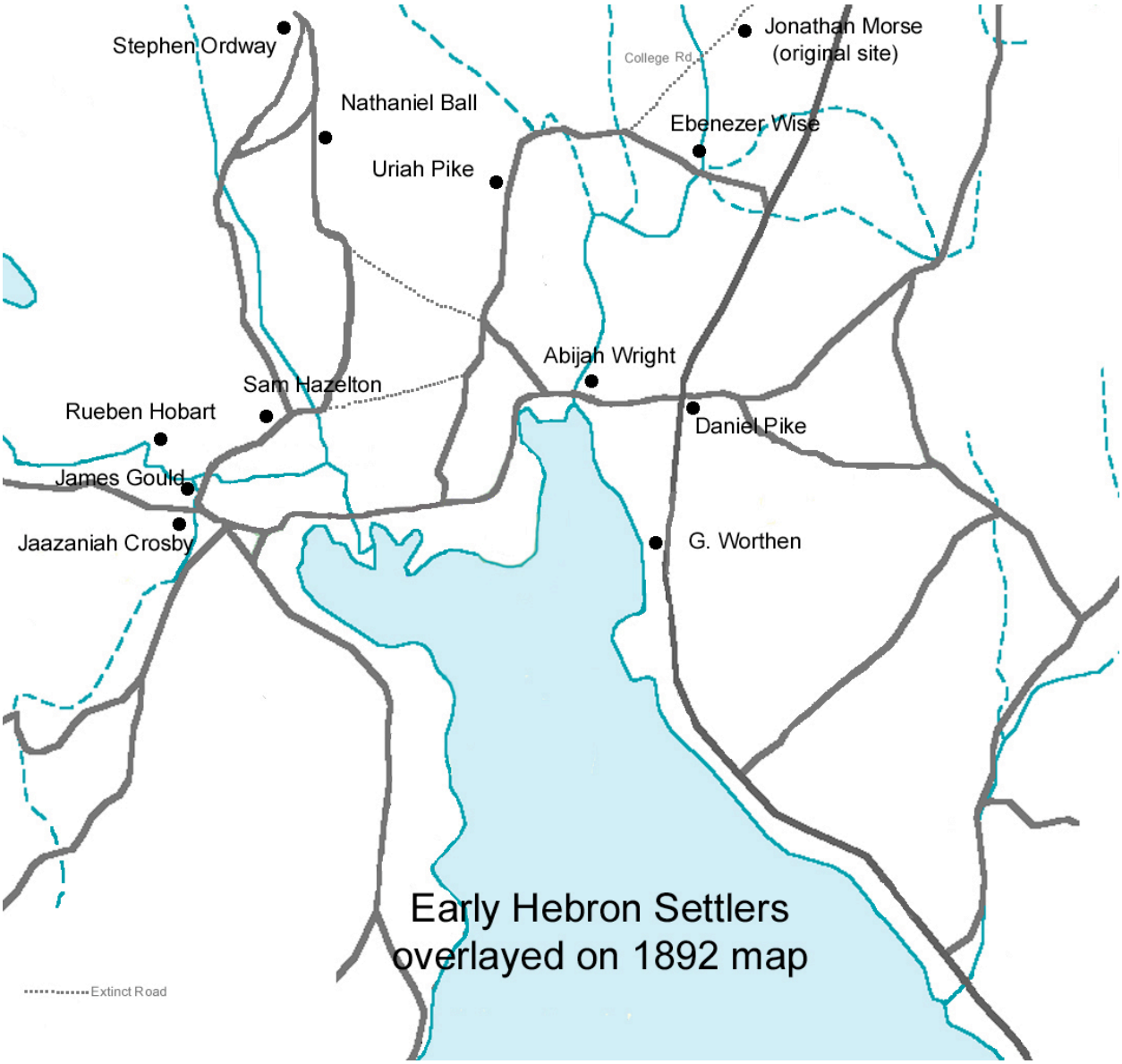
George Smith Barn c1907

Braley Road Bridge built c1927

Historical Road Inventory

College Road built c 1772

The map below illustrates the location of the Old College Road, as well as the home sites of Nathaniel Ball and Stephen Ordway.



Historical Home Site Inventory

See preceding map for home site locations.

Nathaniel Ball Home Site

Stephen Ordway Home Site

Nathaniel S. Berry Home Site

The Nathaniel Berry house is the structure just to the right in the center of the photo.

The Common, Hebron, N. H.

APPENDIX A

Minutes from Community Wide Open Meeting

September 13, 2001

Community Wide Open Meeting
September 13, 2001

The meeting was called to order by Selectmen's Representative to the Planning Board, John Matthews at 7:05 p.m. After a moment of silence for the victims of the terrorist acts, and the Salute to the Flag, the Head Table was introduced. At the Head Table was Jay Matthews, Chairman of the Planning Board, Nancy Johnson the Facilitator from the Lakes Region Planning Commission, her assistant, Kristen, and Jane Ramsay, Secretary to the Planning Board. Phil Twombly and Lee Alexander were recognized for their efforts to make the evening possible, and Betsy Twombly and Barbara Matthews were thanked for the refreshments they provided for all.

Jay Matthews introduced Nancy Johnson who explained the format of the evening's program and a description and purpose of a Master Plan. She quoted RSA674:2 which said , **The master plan shall generally be comprised of a report or set of statements (goals) and land use and development proposals with accompanying maps, diagrams, charts and descriptive matter designed to show as fully as possible and practical the planning board's recommendations for the desirable development of the territory legally and logically within its planning jurisdiction.** She said the Master Plan was a legal document and would provide a legal defense if zoning ordinances were challenged in Court. She said the meeting would ask the people what they liked about Hebron, what they disliked, and what important issues would have to be faced in the future. A report of the meeting would be written up by the Lakes region Planning Commission, and that information would be used to create a survey that would be sent out to all Hebron people, the results of that survey would help determine the goals in the Master Plan.

The demographics of Hebron was discussed. Since 1970, the population has grown from 234 to 459 in 2000. In 1990 there were 386 people and in 2000 there were 459. This reflects a 20% increase. It was brought out that the increase is only about 7 people a year, and perhaps, the real concern should be how many people the town can actually support and how many residents and seasonal homes could be built with the infrastructure in place now. It was felt by some that the existing roads and the development on them, as well as the possible development should be studied before a Master Plan can be developed.

Nancy Johnson asked what people liked best about Hebron and there was a wide range of responses that included:

1. A New England small town
2. Quiet
3. Beautiful
4. Respect for individuals/ privacy
5. Historic/Historical Society
6. Newfound Lake
7. Low level of lighting
8. Not commercial
9. Nice beach
10. Excellent fire and ambulance services
11. Near good educational facilities
12. No major highways running through center of Town
13. Lack of crime

14. Open spaces
15. Recreational opportunities
16. Town plowing of driveways
17. Private camps
18. Town Common
19. Dirt roads
20. No mobile home parks or junk yards
21. Audubon centers
22. Near hospitals and shopping
23. Friendly people
24. Lack of intense development around lake
25. Conservative spending by Town
26. Former low tax rate
28. Community spirit
29. Summer Gazebo programs

The people were asked what they liked least about Hebron, and again, there were many responses. Some of the items that people *liked*, others *disliked*.

1. Taxes/ being a Donor Town
2. The eroding of things that made Hebron a small town
3. Noise from Camps, from the Lake in summer and from snowmachines in winter
4. Lighting pollution from Camps and from outside security lights.
5. Dirt roads
6. Growth in general
7. No trespassing signs/lack of open land
8. Speed on the roads
9. Little traffic control on roads
10. Lack of safety for walkers, joggers and bicyclists on roads
11. Lack of safety on Lake due to boats, esp. Personal watercraft.
12. Too much litter
13. Frequent loss of electric power
14. Use of lawn additives near Lake/ violation of Shore Protection Act laws
15. Escalation of Town spending
16. Overdevelopment of ostentatious homes around Lake
17. Overnight commercial parking on Town Historic land
18. No summer maintenance of roads
19. Plowing of driveways by Town
20. Selling off of old farm land
21. State ruining the Lake by not building a wash station at Wellington Beach boat ramp
22. Threat of overdevelopment/ clear cutting of woodlands

It appeared that several issues were directly related to the State (school taxes, State roads, Newfound Lake, 911, and some of the noise issues) ands as such should be taken up with the State representatives.

Nancy Johnson asked the audience to finish the sentence, "Hebron would be one of the best places to live if only it had..." the responses included:

1. Lower taxes
2. Nothing else
3. Jogging paths around the Lake and 3A
4. A water system and more grooming of trees and bushes on the Common
5. Younger people in Town
6. More people who would volunteer to serve as Town officers and to volunteer to help organizations
7. More frugality in Town government
8. Reopening the road from North Shore to West Shore in front of the old school house to make a complete road around the Common.

When it was asked what important issues would be facing Hebron's leaders and citizens in the future the following were stated:

1. Taxes
2. More active participation needed in State politics to address Lake, Tax, and road problems
3. Need to be fiscally conservative in short term until school funding issues and economy issues are resolved.
4. Urban (or country) sprawl
5. The future of the Marina
6. Support to keep the Hebron Store open as an essential part of the center of Town
7. Milfoil in Newfound Lake
8. Bridgewater-Hebron incinerator
9. Better communication in Town by way of more informal meetings/newsletters
10. Developing ways for people to gift land to Town/ land trust

The stated goals in the 1985 Hebron Master Plan were discussed to see if they still pertained to Hebron today. (see attached copy)

Goal #1 Yes

Goal #2 Should start with "Help"and reference should be made to the Shoreland Protection Act

Goal #3 Yes

Goal #4 Not pertinent now. There should be inspection of plumbing and writing if it is included

Goal #5 Yes

Goal #6 Yes It was suggested that there should be a permanent home for the Historical Society and its materials

Goal #7 Not pertinent

Goal # 8 It was suggested that "opportunities" and "area" rather than "activities"be included
Goal #9 Yes

The LRPC report will be sent to John Matthews.

The meeting adjourned at 9:15 p.m.

Jane Ramsay, Secretary

APPENDIX B

Hebron Master Plan Community Survey

To: All Residents and Taxpayers of Hebron

From: Hebron Planning Board

Jan. 24, 2003

Subject: 2002 Hebron Community Survey

Attached is a survey for your completion that will serve to update the Town's 1985 Master Plan. We've tried to keep it short but still give us the information that will be required as the Town moves into the future.

We would like a response from each adult member of the community. In mailing this single copy with a self-addressed return envelope, we are alerting each family that they have an opportunity to participate. Additional copies for adult family members may be picked up or requested from the Selectmen's office.

Please have your response returned to the Town prior to the end of February. We will be using the remaining winter months to record and process all your submissions. When all is completed, we will report our findings to the community.

We encourage every Hebron adult to respond. Your thoughts are what will drive the future planning of the town. THANK YOU in advance for the time you will spend on this survey

Sincerely;

The Hebron Planning Board

Planning Board
- Jay Matthews Chairman
- Henry Lynch
- Ralph Larson
- Curtis Mooney
- William Gabler
- Alice Kirby
- Sherburn Ramsay-Selectmens Rep

Survey Committee:
- Lee Alexander
- Barbara Brooks
- Ron and Jan Collins
- Andrea and David Goldthwaite
- Nancy Howard
- Jane Ramsay
- Nancy Sycamore
- Phillip Twombly

2003 Hebron Community Survey

The following Community Survey, prepared by the Hebron Planning Board with the assistance of the Lakes Region Planning commission, is the initial part of the Board's effort to up-date the Comprehensive Master Plan, which was implemented in *1985*. The purpose of the survey is to assess the needs and desires of citizens who live here on a full or part-time basis. Your answers will be summarized, published and discussed at a public meeting prior to finalizing the updated plan. In addition to giving the town a basis for future activities, this plan gives added legal strength to the town's zoning regulations, its capital improvement programs, the Historic District, and Subdivision Regulations.

Your participation in providing answers and opinions is essential and valuable since a plan such as this is only worthwhile if it meets the needs and desires of a majority of Hebron's citizens. The Planning Board appreciates your time and effort in providing this important information and thanks you for your participation. We would like to know your views and desires for the future direction in planning for our town. The following is provided for your consideration in formulating your responses:

Hebron population numbers:

Year	Census Population	Change	% Change
1970	234		
1980	349	+ 115	+ 49
1990	386	+ 37	+ 11
2009	459	+ 73	+19

History of Housing Starts (Number of Building Permits Issued for New Residences):

	Year	Number	Year	Number	Year	Number
	1987	9	1992	10	1997	12
	1988	12	1993	9	1998	8
	1989	0	1994	7	1999	6
	1990	8	1995	5	2900	6
	1991	4	1996	14	2001	6

Annual Average (1987-2001), rounded to nearest whole number =8

There were 11 permits issued for 2002.

Hebron Master Plan Survey

1. What is the best thing about living in Hebron?

_____
_____
__
_____
_
_____
_

2. What would you improve about living in Hebron?

_____
_____
__
_____
_
_____
_

3. During the next ten years, would you like to see the <u>permanent</u> resident population of Hebron:

- ☐ a. Decrease
- ☐ b. Stay the same
- ☐ c. Increase slightly
- ☐ d. Increase moderately
- ☐ e. Increase rapidly

4. Which types of development should be encouraged in Hebron? (Check all that apply.)

- ☐ a. Light Industry
- ☐ b. Retail Stores
- ☐ c. Hotels and Motels
- ☐ d. Restaurants
- ☐ e. Professional and Business offices
- ☐ f. Personal Services (e.g., barbers, laundries, etc.)
- ☐ g. Commercial recreation
- ☐ h. Tent/trailer campgrounds
- ☐ i. Home industries and crafts
- ☐ j. Sand and gravel operations
- ☐ k. Affordable housing
- ☐ l. Senior housing

- ☐ m. Summer camps
- ☐ n. Condominiums
- ☐ o. Farms
- ☐ p. Rental Storage Units
- ☐ q. Other _____
  (Please specify)

5. Do you think the Town of Hebron should purchase undeveloped land to preserve open space?

- ☐ a. Yes
- ☐ b. No
- ☐ c. Don't Know

6. Do you think the Town of Hebron should accept gifts of undeveloped land to preserve open space?

- ☐ a. Yes
- ☐ b. No
- ☐ c. Don't Know

7. In your opinion, undeveloped land **owned** by the Town of Hebron should be used to: (Check all that apply.)

- ☐ a. Preserve open space
- ☐ b. Provide for hiking or biking trails
- ☐ c. Provide for river access
- ☐ d. Provide more beach frontage
- ☐ e. Provide more parking space at the beach
- ☐ f. Other _____
  (Please specify)

8. How do you rate the following town **services**. (Check appropriate box.)

Town Services	Excellent	Good	Fair	Poor	Don't Know
Road maintenance – summer					
Road maintenance – winter					
Fire protection					
Police protection					
Ambulance service					
Recreational programs					
Library					
Rubbish disposal					
Elementary Schools					
Middle School					
High School					

9. How do you rate the following town **facilities**. (Check appropriate box.)

Town Facilities	Excellent	Good	Fair	Poor	Don't Know
Fire Department /Ambulance					
Police Department					
Town Clerk/Tax Collector					
Library					
Selectmen/Planning Board					
Elementary Schools					
Middle Schools					
High School					
Cemetery					
Recreational Facilities					
Rubbish Disposal (or is it a Recycling Center?)					

10. Please rate the following town offices, boards and commissions on how convenient their office hours are.

Convenience of Office Hours	Excellent	Good	Fair	Poor	Don't Know
Selectmen's Office					
Town Clerk's Office					
Tax Collector's Office					
Library					
Planning Board					
Zoning Board					
Conservation Commission					
Historic District Commission					

11. Circle all of the following that you believe to be the most serious problems in Hebron.

a. Loss of farm land
b. Lack of multi-family housing
c. Lack of affordable housing
d. Excessive housing development
e. Lack of commercial development
f. Lack of industrial development
g. Road conditions
h. Traffic
i. Loss of open space
j. Property taxes

12. Do you strongly agree, disagree or strongly disagree with each of the following statements? Check the appropriate box.

	Agree Strongly	Agree	Disagree	Disagree Strongly	Don't Know
a. Land should be protected from development.					
b. The Town should consider developing a Town Forest.					
c. Any new development should pay additional money for the impact it has on such things as roads, traffic, schools, etc.					
d. The Town is managing development well.					
e. It is important to provide for affordable housing.					
f. Areas important to wildlife habitat should be preserved.					
g. Attracting new industry is important.					
h. Identifying and preserving historical buildings and sites are important.					
i. Access to our river for recreation should be increased.					
J .Exterior lighting of buildings and parking lots should be regulated					
k. Protection of wetlands is important.					
l. More recreational activities should be developed for adults and seniors.					
m. Recreation programs for teen-agers are adequate.					
n. Preserving the river's shoreline is important.					
o. The quality of water resources is important.					
p. Expend town funds to develop / expand existing town land for recreational use.					

13. Should the Town increase its effort in the maintenance of the town-owned area in and around the Common?

- ☐ Yes
- ☐ No
- ☐ No Opinion

14. Should the Town sponsor land-use workshops to encourage land owners to use the latest information/techniques to manage their land?

- ☐ Yes
- ☐ No
- ☐ No Opinion

15. To preserve open space and provide recreation, would you consider any of the following for land that you now own in Hebron?

	Yes	No
a. Donate some land to the Town.	☐	☐
b. Sell some land to the Town.	☐	☐
c. Place an easement or legal restriction on some land to define future use.	☐	☐

16. In which of the following publications/sources would you like to see notices of Hebron's official meetings and public affairs?

☐ a. Record/Enterprise
☐ b. Laconia Evening Citizen
☐ c. Pennysaver
☐ d. Other local publication_____
(Please Specify)
☐ e. On the Town's Website
☐ f. On Local Access TV

17. What comments or suggestions do you have regarding the Subdivision Regulations or Zoning Ordinances now in effect in Hebron? (Copies are available for review at the Town Offices.)

18. Are you satisfied with the current zoning districts?

a) Lake (800 feet from boundary roads)	☐ yes	☐ no
b) Historic (¼ mile radius from town common)	☐ yes	☐ no
c) Rural (all other)	☐ yes	☐ no

Demographics

19. Where is your permanent residence?

☐ a. Hebron
☐ b. Other NH town or city
☐ c. Out of state

20. How long have you owned property in Hebron?

☐ a. Less than 1 year
☐ b. 1-5 years
☐ c. 6-9 years
☐ d. 10-19 years
☐ e. 20 years or more

21. Your age:(circle one)

a. Under 25 years
b. 25-40 years
c. 41-55 years
d. 56-65 years
e. Over 65 years

The Hebron Planning Board thanks you for taking the time to answer this questionnaire. Your responses will allow us to include your thoughts in the planning for the development of the town. We encourage you to use the space below (and additional pages, if necessary) to include any other remarks that you feel would be appropriate in this effort. ***THANKS AGAIN!***

Additional Comments:

APPENDIX C

Soil Analysis Sections
from
1985 Master Plan

A. Soil Conditions

Soil is a natural, three-dimensional body at the earth's surface which has distinct properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time (Pilgrim and Peterson, 1979). For the purposes of this report, soils in the Town of Hebron have been divided into seven categories based upon the similarity of characteristics, such as parent material, particle size, depth to bedrock and drainage. The classification of soils provides input as to the capability of an area to support development, including building foundations and filtering effluent from septic systems.

Soils data for Hebron was obtained from the Grafton County Soil Survey produced in 1939, with additional assistance from the U.S. Soil Conservation Service. It should be noted that the Grafton County Soil Survey was done primarily for agricultural purposes with special emphasis being given to those features influencing the adaptation of the land for growing crops, grasses and trees. A current soil survey utilizing modern soil survey techniques is not available for Hebron or for any of the Newfound area communities. Although the existing survey does not provide specific detail for planning purposes, it does provide valuable general information for land use planning.

The categories shown on the soils map are:

1. Wetlands Soils: Included in this group are the organic soils; Muck, Peat and Marsh; non-stony and very stony, poorly and very poorly drained mineral soils. The water table ranges typically at or near the ground surface from 5 to 9 months of the year. Some of these soils have standing water on them most of the year.

2. Seasonally Wet Soils: This group includes all moderately well drained soils. The water table rises within 1 - 25 feet from the ground surface in wet seasons.

3. Alluvial Soils on the Floodplains: This group includes all drainage classes that are of stream deposited materials subject to flooding. Some of these Flood Plain soils are also wetland soils. These few soils will appear in both categories, which are indicated on the map legend by cross-hatching.

4. Sand and Gravel Soils: These soils are excessively and well-drained soils on Glacial outwash and Stream Terraces consisting of stratified layers of sand and gravel. Outwash refers to deposition of material by melt water as it flowed from glacial ice.

5. Non-Hardpan Glacial Till Soils: This group includes the well-drained soils formed in material called glacial till. The till consists of varying amounts of different size fragments ranging in size from clay to boulders which were deposited directly from the glacier with little or no water transport.

6. Hard an Glacial Till Soils: This group includes the moderately well drained an well-drained soils formed in glacial till having a distinct compact hardpan layer which retards the downward movement of water.

7. Shallow to Bedrock Soils: This group includes somewhat excessively drained soils formed in glacial till. They are predominately shallow to bedrock soils intermingled with deeper soils. Outcrops are few to many.

For planning purposes, the above soil categories can be classed into three general groups according to their capacity to support development. The first group, which has the highest capability to support development, includes both sand and gravel soils and non-hardpan glacial till soils. These soils, due to high to medium permeability, can generally provide adequate treatment to septic tank effluent and can support construction activities.

The second group has moderate capability and consists of the soils formed on hardpan glacial till. The compact hardpan layer within these soils can prevent the proper movement and treatment of sewage effluent in the soil. It can also be an obstacle in construction. The last group includes wetland soils, soils which have a seasonably high water table and those with a shallow depth to bedrock. All have poor development potential. high water table and proximity of ledge to the surface present serious problems in the proper operation of leach fields and in construction operations.

The general soil groupings discussed above can be summarized as follows:

GROUP 1 SOILS: Slight Limitations
Sand and gravel soils
Non-hardpan glacial till soils

GROUP 2 SOILS: Moderate Limitations
Hardpan glacial till sails

GROUP 3 SOILS: Severe Limitations
Wetland soils
Seasonally wet soils
Shallow to bedrock soils

III. HEBRON SOIL INTERPRETATION AND LIMITATION FOR VARIOUS LAND USES

This section provides information relative to the degree of soil limitations for various land uses. The soil interpretations provide a prediction of the soils behavior under certain conditions. It provides a guide not a recommendation.

Three degrees of soil limitation are used for town planning purposes defined as follows:

GOOD (Slight) -- rating given soils that have properties favorable for the intended use. The degree of limitation is minor and can be overcome easily. Considered to have the best potential.

FAIR (Moderate) -- rating given soils that have properties moderately favorable for the intended use. Limitations can be overcome or modified by special planning, design, or maintenance. Considered to have intermediate potential.

POOR (Severe) -- rating given soils that have one or more properties unfavorable for the intended use. Generally requires major soil reclamation, special design, or intensive maintenance. Considered to have the poorest potential.

A rating of poor does not mean that a soil cannot be used for the intended use. However, it does mean that severe limitations exist that must be overcome with proper design or operation. It commonly is more expensive to develop soils with a severe limitation than those with good or fair limitations.

The following soil limitation information was prepared for specific land uses. On-site investigation of soil type and characteristics is essential for all development purposes as the existing soil classification is primarily for agricultural purposes. Also, some very desirable soil areas are too small in size or too irregular in shape, or their occurrence with less desirable soils forms a pattern too complex to be utilized for the intended use. Although not considered in the interpretations, these items should influence the final selection of sites.

A. Degree of Soil Limitation and Major Soil Features Affecting Town Planning

Septic Tank Absorption Field -- A septic tank absorption field is a soil absorption system for sewage disposal. It consists of a subsurface tile system laid in such a way that effluent from the septic tank is distributed

with reasonable uniformity into the natural soil. The successful operation of a septic tank system depends on the absorptive quality of the soil and the level of the water table during wet seasons. However, design, construction, and maintenance are just as critical as is the kind of soil being used for disposal. A rating of slight will not insure successful operation if improperly designed, installed, or continually used without maintenance. The major soil features affecting use for septic tank absorption fields are permeability of the soil, depth to water table, depth to bedrock or hardpan, steepness of slope, stoniness, rockiness, and hazard of flooding.

Sewage Lagoon -- A sewage lagoon is a shallow pond used to hold sewage for the time required for bacterial decomposition, the process of which is mainly biochemical. Sewage lagoons require consideration of the soil as a vessel for the impounded area and as soil material for the enclosing embankment. Major soil features affecting use for sewage lagoons are permeability of the soil, depth to bedrock, steepness of slope, stoniness, hazard of flooding and organic matter content.

Dwellings -(with basement) -- Ratings are for undisturbed soils on which single-family dwellings or other structures with similar foundation requirements can be built. Buildings are three stories or less and have basements that extend to a depth of at least 5 feet below ground level. Septic tank sewage disposal is not included in the ratings. The emphasis in rating soils for dwellings with basements is on the properties that affect foundations, such as density, plasticity, texture, and shrink-swell potential. Also considered beyond the effects related exclusively to foundations are slope, hazard of flooding, seasonal wetness, stoniness, rockiness, and depth to bedrock.

Dwellings (without basements) -- Dwellings without basements include cottages, summer homes, lodges, and service buildings. It is assumed that construction will be on a slab or on concrete, wood, or steel columns. Ratings are for undisturbed soils on which single-family dwellings (three stories or less) or other structures with similar foundation requirements are built. The same items affecting use for dwellings with basements apply to dwellings without basements. Potential frost action is an additional consideration for dwellings without basements. Interpretations for septic tank sewage disposal is not included in the ratings.

Lawns and Landscaping -- Ratings for lawns and landscaping are based on
soil properties that affect the establishment and maintenance of lawns and shrubs. It is assumed that the lawns will be subject to moderate foot traffic and that fill or topsoil is not brought in. The major soil features affecting use for lawns and landscaping are texture of the surface soil and subsoil, depth

to water table, depth to bedrock, steepness of slope, stoniness, rockiness, and hazard of flooding.

Local Roads, Streets and Parking Lots -- Ratings apply to the use of soils for construction an maintenance of improved local roads, streets and parking lots that have all-weather surfacing--commonly of asphalt or concrete--and that are expected to carry automobile traffic all year. The major soil features affecting this use are depth to water table, steepness of slope, depth to bedrock, stoniness, rockiness, shrink-swell potential, potential frost action, and hazard of flooding.

Shallow Excavations (6 feet or less) -- These excavations require excavation or trenching to a depth of 5 or 6 feet. Limitation ratings for shallow excavations alone are insufficient for such uses as dwellings with basements, sanitary landfills, cemeteries, and underground utility lines. Additional soil features must be considered in evaluating soils for those uses. Major soil features affecting shallow excavations are depth to seasonal water table, steepness of slope, texture of soil to depth to be excavated, depth to bedrock, stoniness, rockiness, and hazard of flooding.

B. Degree of Soil Limitation and Major Soil Features Affecting Recreation Development

Camp Areas (Tent and Camp Trailers) -- Ratings apply to soils to be used for tent and camp trailers and the accompanying activities of outdoor living. It is assumed that little site preparation will be done other than shaping and leveling for tent and parking areas. Desirable areas should be suitable for heavy foot traffic and for limited vehicular traffic. Septic tank sewage disposal, street and access roads, and growing and maintaining vegetation was not considered in the ratings. Major soil features affecting this use are wetness, hazard of flooding, permeability, steepness of slope, surface soil texture, coarse fragments (2 mm to 3 inches) on the surface, stoniness and rockiness.

Picnic Areas (Park Type) -- Ratings apply to soils considered for use as park-type picnic areas. It is assumed that most vehicular traffic will be confined to access roads. Major soil features affecting this use are wetness, hazard of flooding, steepness of slope, surface soil texture, coarse fragments, stoniness and rockiness.

Playgrounds (Athletic Fields) -- Ratings apply to soils to be used intensively as playing fields or courts for baseball, football, volleyball, soccer, or other similar organized games In which soils are subject to heavy foot traffic. Soil suitability for growing and maintaining vegetation is not part of the ratings. Major soil features affecting this use are wetness, hazard of

flooding, permeability, steepness of slope, surface soil texture, depth to bedrock, coarse fragments, stoniness and rockiness.

Paths and Trails (Hiking and Bridle) -- Ratings apply to soils to be used for local and cross-country footpaths and trails and for bridle paths. It is assumed that these areas will be affecting this use are wetness, hazard of flooding, steepness of slope, texture of surface soil, and stoniness or rockiness.

C. Septic Tank Absorption Field

The limitation for septic tank absorption fields are based on disposal of effluent from a septic system by means of a filter field. Ratings are based on year-round use. These interpretations will not eliminate the need for on-site investigations and study of specific sites for future design and construction.

Soil Suitability for Septic Tank Absorption Fields

LEGEND:

- GOOD
- FAIR
- POOR

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PREPARED BY

LAKES REGION PLANNING COMMISSION
MEREDITH, NEW HAMPSHIRE

TABLE II - 3 SOIL LIMITATIONS FOR SEPTIC TANK ABSORPTION FIELDS

	Degree of Limitation		
Items	**Good**	**FAIR**	**Poor**
Effecting Use	**(Slight)**	**(Moderate)**	**(Severe)**
Permeability (rate of volume movement of water)	Rapid-Mod.	Low end of Mod.	Slow
Percolation Rate	Faster than 45 min./in.	45-60 min./in.	Slower 60 min./in.
Drainage Class	Well Drained	----	Mod. Well, Poorly, Very Poorly
Flood Hazard	----	----	Flood Hazard
Slope	0-8%	8%-15%	15%+
Depth to Bedrock (or Hardpan)	More than 72"	48" - 72"	Less than 48"

Rating the soils for septic systems were as follows: Permeability should be rapid to moderate; percolation rate not slower than 60 minutes per inch; well-drained; groundwater level at least 4 feet below during wet seasons; rock formations or other impervious layers, including hardpans, should be more than 4 feet below ground surfaces; slopes should be under 15%; no flood hazard; system not within 75 feet of a stream or any other water body.

The soils suitable for septic tank absorption fields are those with slight limitations. They are Agawam, Adams, Hinckley, Merrimacs, Gloucester, Colton, Danby and Hermon stony sandy loam. The Grafton County Soils description of Colton and Danby mention a bedded layer 36' from the surface. This bedded layer refers to alternating layers of sand and gravel, which have rapid permeability and pose no problem providing the slope is all right.

Rough stony Hermon was rated moderate because of its greater stone content along with rough stony Gloucester. Also, all soils suitable for septic systems but on an 8-15% slope were included in the moderate rating.

The problem soils and why rated severe:

Becket loam; Becket stony loam: permeability slow; percolation slow; also a hardpan layer about two feet below ground surface.

Rough Stony Becket: Same as Becket with a greater degree of slope and greater stone content.

Suffield silt loam: Permeability slow, seasonal water table 2 1/2-3 feet from ground surface.

Canaan loam: Depth 20", shallow over bedrock.

Canaan stony sandy loam: Same with rock outcrops.

Peru loam, stony loam: Hardpan 2' down, stones and boulders throughout soil, high water table (1-1 1/2' down).

Podunk fine sandy loam, silt loam: Soils on the flood plains, subject to flooding, seasonal high water table (1-1 1/2' down).

Ondawa fine sandy loam, sand loam, loamy fine sand: Subject to flooding.

Whitman stony loam, loam: Very poorly drained, a distinct hardpan present 2 feet down, half-bog soils in swale-like depressions in the uplands.

Muck: severe wetness, organic matter, ponded.

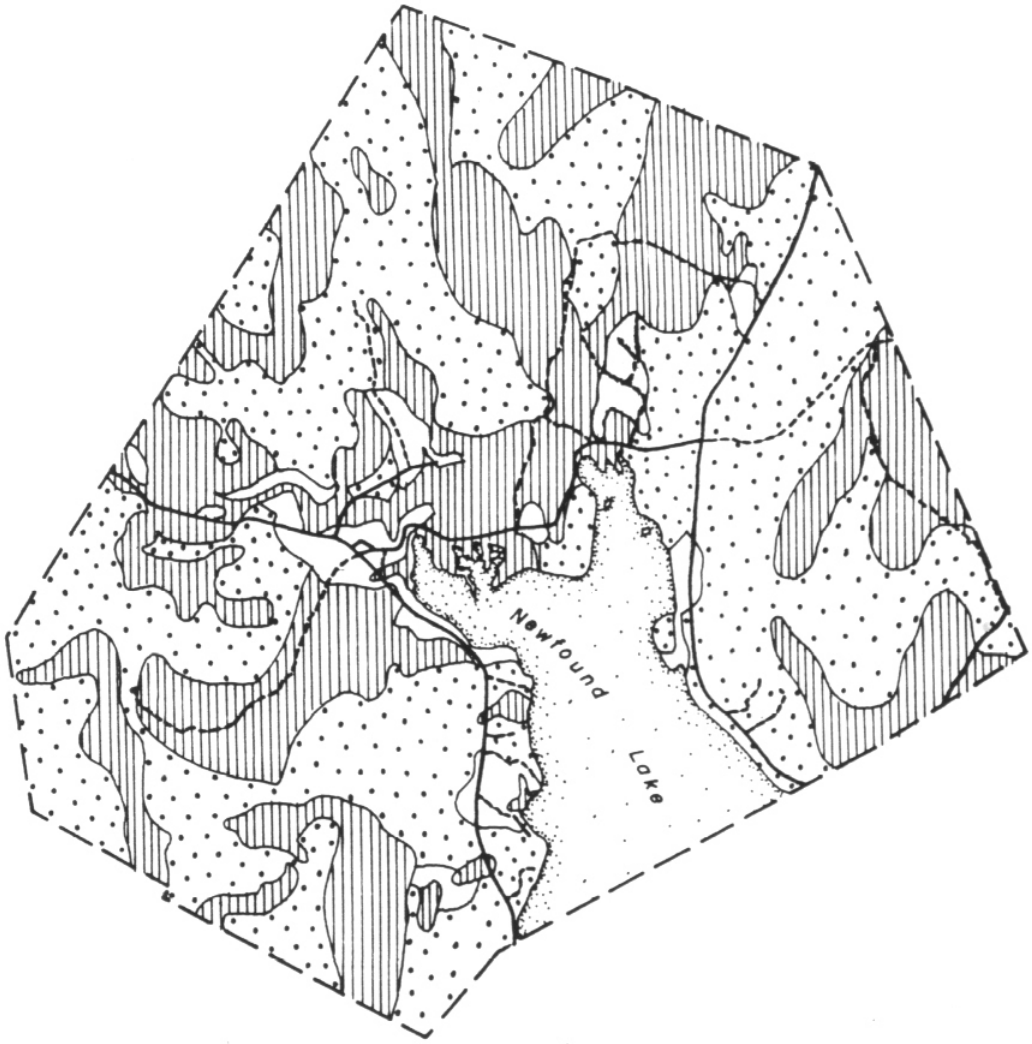
D. Dwellings with Basements

Ratings for dwellings with basements are based on the construction of buildings that are for year-round use and that have three stories or less with a basement at least 5 feet below the normal ground level. Specific locations of buildings require on-site investigations.

TABLE II – 4 SOIL LIMITATIONS FOR DWELLINGS WITH BASEMENTS

	GOOD	**FAIR**	**POOR**
Item	**(Slight)**	**(Moderate)**	**(Severe)**
Potential Frost Action	Low	Moderate	High
Drainage Class	Well Drained	Mod. Well	Poorly, Very Poor
Flood Hazard	---	---	Flood Hazard
Slope	0 - 8%	8 - 15%	15%+
Depth to Bedrock (or hardpan)	More than 60"	40" - 60"	Less than 40"

Soil Suitability for Dwellings with Basements



LEGEND:

- GOOD
- FAIR
- POOR

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The soil must be at least five feet to bedrock to rate slight for this use. Depth to bedrock or hardpan under 40 inches is severe. A high water table will increase the severity of potential frost action.

Soils suitable with slight ratings are Agawam, Adams, Coltons, Danby, Hinckleys, Merrimacs, Hermons and Gloucesters.

Becket soils are rated moderate because of its compact till layer at two feet below the surface which causes seepage problems. Also, soils where slopes are 8-15% are rated as moderate.

Suffield silt loam is rated moderate because of its moderate drainage and slow permeability due to the character of the compact clayey area 24-36 inches from the ground surface. Suffield has a three-foot water table, which causes the soil to have a moderate potential frost action.

Soils rated severe are:

Canaan: shallow to bedrock.

Peru: hardpan, high water table.

Podunk: flood hazard and seasonal high water table - potential frost action and shrink-swell problems with basements

Ondawa: flood hazard

Whitman: high water table; hardpan 2 feet below ground surface.

Muck: high water table, ponded area - severe potential frost action.

E. Streets and Roads

Ratings for roads, streets and parking lots take into account soil properties that limit locations and construction of roads in future subdivisions. Hard-surfaced pavements are assumed. Major highways are not considered. Specific road and street layout requires on-site investigation.

TABLE II - 5 SOIL LIMITATIONS FOR STREETS AND ROADS

GOOD	FAIR	POOR	
Item	**(Slight)**	**(Moderate)**	**(Severe)**
Potential Frost Action	Low	Moderate	High
Drainage Class	Well Drained	Mod. Drained	Poorly Drained & Very Poor
Flood Hazard	No Flood Hazard	Once in 5 yrs.	More than 1 in 5 Years
Slope	0 – 3%	3 - 8%	More than 8%
Depth to Bedrock	More than 40"	20" - 40"	Less than 20"

Soil Suitability for Streets & Roads

LEGEND:

- GOOD
- FAIR
- POOR

TOWN OF HEBRON

PREPARED BY

LAKES REGION PLANNING COMMISSION
MEREDITH, NEW HAMPSHIRE

Listed below are soils found in Hebron and their limitations for road construction. The most critical soils in this group are those with potential frost action, flood hazard soils and steep slope.

The soils with slight limitations are: Merrimacs, Coltons, Danbys, Hinckleys, Agawams, Gloucesters and Hermons.

Soils with moderate limitations besides a 3-8% slope rate are:

Peru: moderate depth and potential frost action.

Becket: because of depth to hardpan 2 feet down.

Suffield: moderate potential frost action and depth to water table.

The severe soils are:
Podunk: flood hazard; Whitman: high water table, half-bog soils; Muck: severe wetness: Ondawa: flood hazard and Canaan: shallow over bedrock.

F. Description of Soils and Land Types

The following information provides a brief description of soil, basic land forms and major soil properties found within southern Grafton County. Their distribution is shown on the accompanying Town of Hebron soil map. The soils are listed alphabetically. The mapping symbol is listed along with the name of each soil type. Soils are subdivided into mapping units on the basis of stoniness and other factors which affect their use.

Adams Soils

Map Symbol	Soil Type
Ad	Adams loamy fine sand

Deep, sandy, droughty soils of the outwash terraces. Generally more than 2% organic matter in the upper subsoil. The water table is generally more than 5 feet below the ground surface. Permeability is rapid.

Agawam Soils

Map Symbol	Soil Type
Af	Agawam fine sandy loam

Deep, well-drained soils of the stream terraces. The water table is generally more than 5 feet below ground surface. Water moves freely through the soil.

Becket Soils

Map Symbol	Soil Type
Bt	Becket stony loam
Bl	Becket loam
RsBe	Rough stony Becket

Deep, well-drained sandy soils of the uplands. Generally more than 2% organic matter in upper subsoil. A distinct hardpan is present at about 2 feet below ground surface. Water moves slowly through soil.

Canaan Soils

Map Symbol	Soil Type
Ca	Canaan loam
Cd	Canaan stony sandy loam
Co	Canaan stony fine sandy loam

Shallow, somewhat droughty sandy soils of the uplands. This soil is developed from shallow glacial till over bedrock in almost flat areas in the plateau tops. Generally have more than 2% organic matter in upper subsoil. Bedrock occurs at about 20 inches below ground surface. Downward water movement is restricted by bedrock.

Colton Soils

Map Symbol	Soil Type
Ct	Colton sandy loam
Cy	Colton loamy sand
Cg	Colton gravelly sandy loam

Deep, droughty soils formed in layered sand and gravel. Colton series have more than 2% organic matter in the upper subsoil and they generally contain gravel near the ground surface. Water moves rapidly through the soil. The water table is usually more than 5 feet below the surface.

Danby Soils

Map Symbol	Soil Type
Dg	Danby gravelly sandy loam

Danby gravelly, sandy loam, like the Hinckley soils, is developed on kames having a hummocky topography, but it occurs more commonly in valleys in

the northern part of the county where the climatic conditions are similar to those giving rise to the Colton soils on the associated terraces. Below a depth of 3 feet, in most places, this material becomes bedded and, in some places, it is composed of roughly assorted sand and water worn or rounded gravel. The sand grains are mostly quartz, whereas, the larger fragments are mainly schist or granite.

Gloucester Soils

Map Symbol	Soil Type
Gf	Gloucester fine sandy loam
G1	Gloucester stony fine sandy loam
RsG	Rough stony Gloucester

Deep, well-drained sandy soils of the uplands. The water table generally is more than 3 feet below the ground surface. Water moves freely through soil. These soils are commonly loose and, although stony, are easy to dig. They are rapidly permeable and somewhat droughty. Except for slope and stoniness, these soils have no serious limitations for most non-farm uses.

Hermon Soils

Map Symbol	Soil Type
Hr	Hermon stony sandy loam
RsH	Rough stony Hermon

Deep, well-drained sandy soils of the uplands. Hermon soils usually have 2% organic matter in the upper subsoil. The water table is generally more than 3 feet below the ground surface. Water moves freely through soil.

Hinckley Soils

Map Symbol	Soil Type
Hy	Hinckley loamy sand
Hg	Hinckley gravelly fine sandy loam

Deep, droughty nearly level to very steep soils formed in deep layered sand and gravel. Gravel layers generally occur near the ground surface. The water table is generally more than 5 feet below the ground surface. Soils are droughty and very rapidly permeable. Entire subsoil is loose and porous enough for free movement of air, water and roots.

They have few limitations for most non-farm uses. Droughtness limits establishing and maintaining lawns and slope limits some non-farm uses.

Many areas of Hinckley soils are sources of sand and gravel for construction.

Merrimac Soils

Map Symbol	Soil Type
Ms	Merrimac sandy loam
Me	Merrimac loamy sand
Ml	Merrimac gravelly sandy loam

Deep, well-drained sandy soils formed in layered sand and gravel. Gravel layers generally occur at about 24 inches from ground surface. The water table is generally more than 5 feet below the ground surface. Water moves rapidly through the soil.

Muck

Map Symbol	Soil Type
Mu	Muck

Muck consists of dark brown or almost black partly decomposed organic matter ranging in thickness from 2 to 5 or more feet. It contains some mineral material. In most places the muck is woody, but, in some places, it is developed from reeds and sedges. The reaction is highly acid. In stream bottoms the underlying material is gray sand, but in the uplands it is bluish-gray till. In some places this land is covered with coarse wild grasses, but in most places, it supports a growth of soft maple, willow and alder trees.

Ondawa Soils

Map Symbol	Soil Type
On	Ondawa sandy loam
Os	Ondawa fine sandy loam
01	Ondawa loamy fine sand

Nearly level, well-drained soils that formed in deep sand and are subject to occasional flooding. Soils are mostly on high bottoms along the Pemigewasset and Gunstock Rivers. Ondawa soils are rapidly permeable and usually supply adequate moisture for plants.

Ondawa soils commonly adjoin steep gravelly Hinckley soils and other soils along the rivers. They are members of a drainage sequence with moderately well-drained Podunk and the poorly drained Rumney soils. The water table is generally more than 3 feet below the ground surface.

Peru Soils

Map Symbol	Soil Type
P0	Perunloam
Ph	Peru stony loam

Deep, moderately well-drained loamy soils of the uplands. They generally have more than 2% organice matter in the upper subsoil. A distinct hardpan is present about 2 feet below ground surface. During wet season, the water table rises to within 1 1/2 to 2 feet of the ground surface. Water moves slowly through soil.

Podunk Soils

Map Symbol	Soil Type
P1	Podunk silt loam
Pf	Podunk fine sandy loam

Deep, moderately well-drained soils of the flood plains. During wet seasons the water table rises to within 1 1/2 to 2 feet of the ground surface and water moves freely through the soil. These soils formed in deep, water-sorted sand. They are near large and small streams and are flooded annually. Present woody vegetation consists mostly of alder, willow and red maple. Permeability is rapid, available water capacity is moderate.

Suffield Soils

Map Symbol	Soil Type
S1	Suffield silt loam

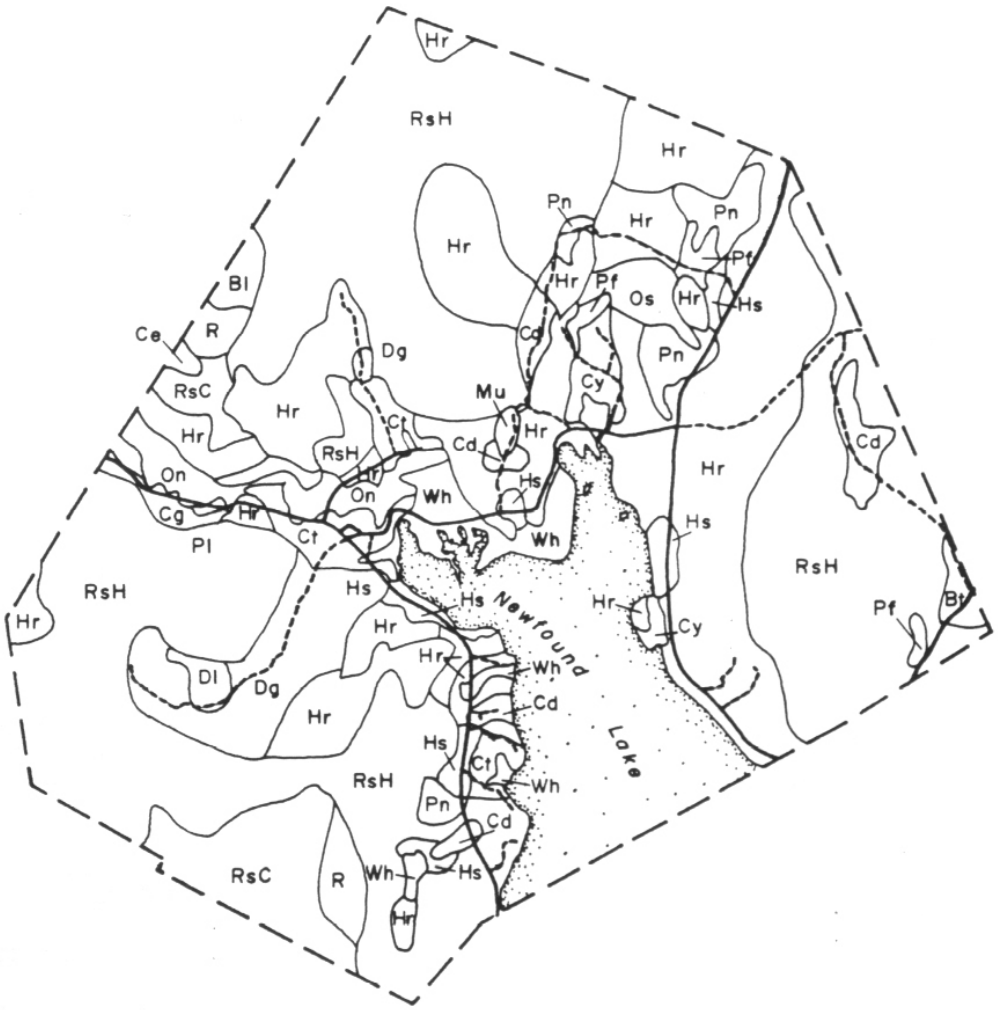
Deep, well-drained soils formed in silt and clay deposits. The water table is generally more than 3 feet below ground surface. Water moves slowly through soil. This soil occupies smooth or level terraces. Drainage is fairly good but is slightly retarded by the heavy character of the subsoil.

Whitman Soils

Map Symbol	Soil Type
Wh	Whitman loam
Wo	Whitman stony loam

Very poorly-drained loamy soils of the uplands. A distinct hardpan is present at about 2 feet below the ground surface. Whitman soils are completely saturated with water for most of the year. Water stands on the surface for most of the winter and spring. Water moves through the soil slowly. The mineral soils of the swamps are members of Whitman series.

Soil Conditions



Source:
Grafton County Soil Survey - 1939
Refer to County Soils Map (1939) for
Additional Detail.

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