

# Gilmanton, New Hampshire Natural Resources Inventory

September, 2004



Gilmanton Conservation Commission  
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## Natural Resources Inventory

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## 1.0 PROJECT SUMMARY/INTRODUCTION

Gilmanton is a large, rural town with a population of 3,400 covering 38,127 acres in central New Hampshire. It is located in Belknap County south of Lake Winnepesaukee. Its diverse topography in combination with the many lakes, streams, forests, and farms provides a high quality of life for Gilmanton residents and excellent habitat for native plants and animals.

This natural resource inventory is a description and analysis of the significant natural resources found in the town of Gilmanton. It covers water, wildlife, forest, natural communities, agricultural, and soil resources. It also lists lands in Gilmanton that have been permanently conserved to protect their natural resources for the benefit of future generations.

This information is intended to be a resource for landowners, town officials, and citizens who are the long-term stewards of Gilmanton's natural resources. Specifically, it can be used to:

- Educate and promote awareness about Gilmanton's natural resources;
- Document current conditions so changes over time can be assessed;
- Develop land conservation priorities and a plan for Gilmanton;
- Provide a basis for master planning, ordinance revisions and planning decisions.<sup>1</sup>

New Hampshire's population is increasing more rapidly than any other state in the Northeast. Gilmanton, along with the other towns in the state, must accept the challenge of conserving significant resources in the face of increasing development and population pressures. This report should provide the community with a sound foundation upon which land use decisions can be based.

A Natural Resources Inventory is never "finished" as the availability of new data and new mapping capabilities make it necessary to update the inventory periodically. An important missing part of this inventory is soils data. This is because revised Natural Resources Conservation Service (NRCS) soil maps for Belknap County have not been completed and digitized. Additional maps for the inventory should be made once this soils data is available. In addition, the information contained in this report will be more useful to community decision makers when digitized tax parcel information becomes available.

Information in this inventory was compiled from many sources. References and acknowledgements are found at the end of this report. Citizen input was gathered at a series of public meetings sponsored by the Planning Board and Conservation Commission in 1999, 2000 and 2001. A newspaper article in late 2001 solicited citizen input regarding scenic resources and a survey in the spring of 2003 was used to collect information about the resident's opinions regarding the town forests. A survey was distributed at the 2004 Town Meeting asking residents to share their knowledge of valuable natural resources within the Town.

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<sup>1</sup> Stone, Amanda J.L., *Natural Resources Inventories, a Guide for New Hampshire Communities and Conservation Groups*, UNH Cooperative Extension, Durham, NH, 2001.

## 2.0 TOPOGRAPHY

Topography is diverse and the town ranges from approximately 550 feet in elevation at Rocky Pond up to 1945 feet on Mt. Mack in the Belknap Mountains. In general the terrain is more rolling near the Loudon Town line and more rugged closer to the Belknap Mountain range in the northern portion of the Town. Figure 2 is a map showing topography in shades of green and steep slopes in shades of red. The rolling terrain near the Loudon town line can be seen visually as the contour lines are further apart. Similarly, the contour lines are closer together in the more rugged and steep areas of the Belknap Mountain Range. This map shows a continuous corridor of higher elevation land stretching from Pancake Hill in the southeast, to Frisky Hill, to Peaked Hill, and to Grant Hill. This series of high elevation lands continues into the Belknaps and includes Durrell Mountain, Whiteface Mountain, Swett Mountain and Mount Mack. These lands make a significant contribution to many of the scenic views in the Town. Approximately 45% of Gilmanton is over 900 feet in elevation.

### 2.1 Steep Slopes

Slopes in excess of 25% should not be built upon especially where soils are thin or highly erodible. In addition, road access is very difficult where slopes are so steep. Most of Gilmanton's steepest slopes are located near mountain peaks and along the sides of ridges, with the highest frequency near the Belknap Mountains in the northern end of the Town. These slopes are shown on the Topography Map in Figure 2 and on Figure 8, the Constraints Map. The Constraints Map shows areas of the Town that are not appropriate for development. In addition to steep slopes, wetlands, surface waters, conservation lands and paved areas are included. Approximately 5% of the Town has slopes in excess of 25%.

### 2.2 Ecological Regions

Like the rest of New England, Gilmanton was shaped by glaciation. The motion of the glacier moved large amounts of rock and soil materials and smoothed the topography giving a more rounded appearance to the topography. However, the glacier also left us with coarse, stony and often infertile soils.

By combining knowledge of the physical environment with what is known of the distribution of plants and animals, the U.S. Forest Service has divided New Hampshire into the following three principal biophysical or ecological regions or sections:

- Southern New England Coastal Plain and Hills Section (southeastern part of NH);
- Vermont-New Hampshire Upland Section (southwestern part of NH);
- White Mountain Section (Northern part of NH).

Gilmanton is located in the Southern New England Coastal Plain and Hills Section which can be further divided into three subsections:

- Gulf of Maine Coastal Lowland (immediate coastal region);

- Gulf of Maine Coastal Plain (southern portion);
- Sebago-Ossipee Hills and Plain (northern portion).

Gilmanton is in the Sebago-Ossipee Hills and Plain, a subsection characterized by more rugged topography. Mountains, hills and ridges of glacial outwash, large wetland complexes and large natural lakes distinguish this subsection.

### 2.3 Land Cover

Figure 3 is a Land Cover or Land Use map for Gilmanton. The data on this map is from the 2001 New Hampshire Land Cover Assessment which is based on LANDSAT satellite imagery. This data is accurate to within approximately 0.2 acres. A detailed explanation of the methodology behind this data can be found in *New Hampshire Land Cover Assessment Final Report*; Complex Systems Research Center, UNH, January, 2002. Table 1 below details the acreage and percent of the Town for each Land Cover type.

**Table 1 Gilmanton Land Cover**

Land Cover	Acres	Percent
Mixed Forest	13,088	34.33
Beech/Oak	8,386	22.00
Other Hardwoods	4,365	11.45
White/Red Pine	3,119	8.18
Open Water	1,938	5.08
Hay/Pasture	1,898	4.98
Other Cleared	1,789	4.69
Hemlock	968	2.54
Transportation	774	2.03
Spruce/Fir	596	1.56
Non-forested Wetlands	589	1.55
Paper Birch/Aspen	184	0.48
Forested Wetlands	122	0.32
Row Crops	120	0.32
Developed	109	0.29
Disturbed	72	0.19
Orchards	5	0.01
Pitch Pine	3	0.01
<b>Total</b>	<b>38,125</b>	<b>100.0</b>

### 3.0 SOILS

Understanding the nature and properties of soils is critical to managing and conserving our natural resources. Through its Soil Survey Program, the Natural Resources Conservation Service (NRCS) studies and inventories soil resources across the country. Soil scientists make this study



in order to determine what soils are present, where they are located and how they can be used. Soil surveys contain information in the form of detailed soils maps, data tables and text narratives that can be used in order to determine appropriate uses for the land. Soil surveys also contain predictions of soil behavior for selected land uses and highlight limitations and hazards inherent in the soil and the impact of selected land uses on the environment.

It is important to note that these soil survey maps are designed for general planning purposes and are not at a scale appropriate for site specific use. A site specific soils map should be done by a licensed professional soil scientist wherever there are concerns about the capability of the land for development. The soil survey maps should not be enlarged because this would imply more accuracy in the data than is present.

### **3.3 Belknap County Soils Maps**

The most recently published edition of the Belknap County Soil Survey was issued in November 1968. The maps in this edition have never been digitized and therefore are not available for GIS mapping. As a result, data on the location of prime farmland soils, important forest lands and hydric soils has not been included in this Natural Resource Inventory or in any of the maps associated with it.

An update of this survey for Belknap County has been underway for several years. It is anticipated that this update will be completed by the spring of 2005 and will be available in digital format at the same time. The maps for the Natural Resource Inventory should be updated once the soils data is available digitally in order to include the following:

- Prime farmland and farmland of statewide importance;
- Important forest lands;
- Hydric soils.

### **3.4 Soils Recommendations**

Soils determine how land should and should not be used. It is important that land use decisions be based on accurate soils information.

- Revise this Natural Resource Inventory and its associated maps once the updated soil survey maps have been digitized.
- Require site specific soil mapping or HISS mapping on all subdivision applications. Soil mapping must be completed by a Certified Soil Scientist in accordance with the Site-Specific Standards, either HISS standards or Site-Specific Mapping. Site-specific mapping requires that a report be submitted by the Certified Soil Scientist. The Certified Soil Scientist should be required to stamp all plans that show the delineated soils.

## 4.0 WATER RESOURCES

Gilmanton's water resources consist of a hydrologically connected system of ponds and lakes, streams and rivers, wetlands, and groundwater. Gilmanton's surface and groundwaters are intricately interconnected. In some locations and under some conditions, the surface waters recharge the groundwater and in other locations and conditions, the groundwaters feed our lakes, wetlands and streams and keep surface waters flowing even during droughts. The quality and quantity of one can significantly affect the other.

Our water resources are vital for habitat for plants and animals. Undeveloped shoreline areas are essential for almost all wildlife species during some portion of their life cycle. Gilmanton residents rely upon clean groundwater from private wells. These lakes and ponds, and the quality of their waters and shoreline, are very important to the quality of life for residents and visitors. Fishing, boating and swimming in Gilmanton's waters are popular activities. Our lakes and ponds add enormous value to the tax base and host many second homes, which provide significant net income to the town.

### 4.1 Watersheds

A watershed is defined by the height of land around a basin that feeds water into a particular river system. How people use land within a watershed determines the quality of the water in the lakes, streams, wetlands, and groundwater below. Gilmanton lies entirely within the large watershed of the Merrimack River. There are five smaller watersheds within the town that all flow into tributaries of the Merrimack. The headwaters for each of these watersheds are primarily in Gilmanton, which means that the quality of these water sources depends primarily on how Gilmanton landowners care for their land and the land use decisions that are made by the Town. Each watershed is shown as a different color on Figure 4, the Surface Water Features Map.

1. Winnepesaukee River Watershed—(6.87% of town) This watershed is in the northwestern section of town. It is drained by the streams that flow into Sawyer Lake and its outflow, Badger Brook, on its way to Belmont. The watershed is defined by the height of land formed by Lamprey and Bradford Hills in the north, the hills east of Sawyer Lake, and the transfer station on Rt. 107. It is sparsely populated with the exception of the Sawyer Lake area.
2. Soucook River Watershed—(24.32% of town) This watershed includes Gilmanton Corners and the southwestern part of town. Its watercourses include: Huckins Brook, flowing from the Corners into Shellcamp Pond; Academy Brook, draining Shellcamp Pond; Loon Pond and its tributaries; Loon Pond Brook; and Kimball Brook which parallels Route 106 and flows into Rocky Pond. Development is concentrated in the Corners village, near Allens Mills Road, around Shellcamp Pond, and in the business zone on Rt. 106.
3. Upper Suncook River Watershed—(60.91% of town) The Suncook River's most northerly headwaters are in the Belknap Mountains. Upper Round Pond in Gilford and Hills Pond and Sunset Lake (partially) in Alton flow into Crystal Lake, where the Suncook River begins. Important tributaries to the Suncook include Nelson Brook

and its associated wetland complexes: Nighthollow Brook; Varney Brook and Meetinghouse Pond; and Ayers Brook. This watershed empties into Upper Suncook Lake just after the Suncook River leaves Gilmanton and enters Barnstead near Camp Fatima. Development that impacts this watershed is focused around Crystal Lake, the Iron Works village and Stone Road area.

4. Lower Suncook River Watershed—(7.66% of town) A small portion of this watershed is located in the southern tip of Gilmanton. It drains into Rollins Pond and Kelley Brook. From there it flows into Barnstead and the Suncook.
5. Winnepesaukee Drainage Watershed— (0.18% of town) A very small portion of this watershed is in Gilmanton. It is to the northeast of the top of Hall’s Hill.

The Friends of the Suncook River was formed in 2000 to maintain a healthy watershed by identifying and protecting important natural resources, by forming a greenway network of voluntarily connected lands, and by educating and engaging citizens in these efforts. For additional information, they may be contacted at PO Box 34, Center Barnstead, NH 03225-0034. Their e-mail address is [suncook@worldpath.net](mailto:suncook@worldpath.net) and they maintain a website at [www.friendsofsuncookriver.org](http://www.friendsofsuncookriver.org).

## 4.2 Lakes and Ponds

Gilmanton is blessed with all or portions of ten lakes and ponds of at least ten acres in size. Termed “great ponds” by the NH State Legislature, these are public waterbodies held in public trust for all the people of New Hampshire. These lakes and ponds are shown on Figure 4, the Surface Water Features Map and Table 2 below.

**Table 2 Gilmanton’s Great Ponds**

Name	Pond Size (acres)	Acres in Gilmanton	Percent in Gilmanton	Lake Association
Crystal Lake, including Suncook River above dam	451	451	100%	yes
Sunset Lake	253	50	20%	yes
Manning Lake	196	196	100%	no
Shellcamp Lake	148	148	100%	yes
Loon Pond	128	128	100%	yes
Rocky Pond	82	38	36%	no
Sawyer Lake	82	82	100%	yes
Lake Eileen	45	45	100%	no
Rollins Pond	30	30	100%	no
Meetinghouse Pond	26	26	100%	no
TOTAL	1441	1194		

Landowners around some of Gilmanton’s lakes and ponds have formed associations that, among other things, are concerned about the quality and use of the lakes. Some of them

monitor the quality of the water and report results to the New Hampshire Department of Environmental Services Lakes Monitoring Program.<sup>2</sup>

The total area of great ponds that are located within the boundaries of Gilmanton is 1194 acres. Note that portions of Rocky Pond and Sunset Lake are outside of the Town. Some of these ponds' shorelines were intensively developed before zoning was adopted by the town in 1970. Sawyer Lake, Crystal Lake, and parts of Shellcamp and Loon do not have much undeveloped shoreline left. The quality of the water in these lakes depends upon careful land management by landowners to minimize the application of lawn chemicals, maintain and pump out septic systems regularly, retain shoreline tree and shrubs buffers, and minimize exposure of raw soil to the elements. Many of these lakes and ponds are affected by dams. Careful management of these dams can minimize shoreline erosion and impact upon aquatic species.

Some ponds are relatively undeveloped, including Meetinghouse, Rollins, and Eileen. In addition, portions of the shoreline on Manning, Loon, Shellcamp and Sunset are undeveloped and of great value to wildlife, water quality, and scenic beauty. Significant portions of the shoreline of Manning Lake and Sunset Lake are owned by the Daniel Webster Boy Scout Council and protected from development under a conservation easement held by the State of New Hampshire. The southwest shoreline of Loon Pond is protected from further development by a conservation easement currently held by the Gilmanton Land Trust.

Nelson Pond, a part of Nelson Brook, is not considered to be a Great Pond by the State, but is 33 acres in size. Ponds of less than ten acres in size can also be very important habitat. Two kettle hole ponds on Crystal Lake Road, one opposite Boat Ramp Road and one at the intersection with Pine Circle, are very unusual and largely intact. A smaller kettle hole pond is on Pine Circle closer to Crystal Lake. A kettle hole is a hollow that results from the melting of a mass of ice trapped in glacial deposits. The hole fills with water, vegetation accumulates and peat develops. They are ringed by vegetation typical of bogs.

Land uses adjacent to ponds, lakes and rivers have a significant impact upon the quality of the water. The State of NH passed the Comprehensive Shoreland Protection Act (CSPA) on July 1, 1994 to regulate activities within 250 feet of the edge of all great ponds and fourth order or higher rivers. Great ponds in Gilmanton are listed in Table 2 above. There are no fourth order or higher rivers in Gilmanton. A natural woodland buffer, where existing, must be maintained within 150 feet of the water and a primary structure must be set back 50 feet from the water. Additional information about this law can be found in Appendix A and on the web at <http://www.des.state.nh.us/cspa>. Other sources of information include *Planting Shoreland Areas* by Ralph M. Winslow Jr., UNH Coop. Ext. available online at <http://ceinfo.unh.edu/Pubs/HGPubs/plntshor.pdf> and *A Guide to Developing and Re-Developing Shoreland Property in New Hampshire*,

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<sup>2</sup> For more information, contact the NHDES Lakes Monitoring Program at 271-3406.

available from the North Country Resource Conservation and Development Area Council in Laconia.

Two exotic aquatic plant species, milfoil and fanwort, are another threat to Gilmanton's lakes and ponds. These plants displace beneficial native plants and become economical and recreational nuisances by forming dense matted stands in shoreline areas. Nearly 60 lakes in New Hampshire are infected with milfoil. The only infected lake in Gilmanton is Rocky Pond. However, the plant is readily introduced into another lake when a fragment attaches itself to a transient boat or boat trailer. Boat owners should inspect their boat and trailer carefully before launching.

### 4.3 Rivers and Streams

The Suncook River and the many named and unnamed streams in Gilmanton are an important natural resource. There are 94 miles of perennial rivers and streams in the Town and 35 miles of mapped intermittent streams. Many intermittent streams are too small to be mapped and are not included in the above statistics. Few of these water resources have any sort of biological or chemical monitoring. However, all of these streams are at the headwaters of a watershed and their water quality has a significant impact upon the water quality of the entire watershed. The rivers and streams played an important role in the settlement and early industry of the town. Historic mill-sites are located on the Suncook in the Iron Works village, on Academy Brook (Jones Mill), Kimball Brook (Allens Mill), and Kelley Brook. Numerous aquatic species call these rivers and streams home. The water courses and their adjacent riparian corridors are important habitat and travel corridors for most of Gilmanton's terrestrial wildlife. In addition, many bird species are attracted by the water and the food sources that are located nearby.

**Table 3 Gilmanton's Named Rivers and Streams**

<b>Watershed</b>	<b>River/Stream</b>
Winnepesaukee River Watershed	Badger Brook
Soucook River Watershed	Kimball Brook Academy Brook Loon Pond Brook Huckins Brook
Upper Suncook River Watershed	Suncook River Nelson Brook Nighthawk Hollow Brook Varney Brook Ayers Brook
Lower Suncook River Watershed	Kelley Brook

The quality of water and habitat in rivers and streams depends upon surrounding land uses and management practices. Sediment from erosion destroys spawning habitat and fills stream beds. Removal of streamside vegetation raises water temperatures and can destroy habitat for trout and many other species upon which fish depend.

Currently, development is sparse along Gilmanton's rivers and streams. Stream habitat is relatively unaltered except for a few locations where there is intensive development, such as in the Corners village along Huckins Brook, and along Rt. 106 and Kimball Brook. There are no significant human withdrawals of water from Gilmanton's streams or rivers. However, as development pressures mount, streamside and stream integrity will be threatened.

#### **4.4 Water Resource Recommendations**

- Implement a Wetlands Ordinance to protect the Town's lakes, ponds, rivers, streams and ultimately watersheds.
- Protect riparian corridors to maintain water quality and wildlife habitat.
- Educate the public about non-point pollution from pesticides, fertilizers, sediment and other pollutants in water runoff.
- Inform the public of the Comprehensive Shoreland Protection Act.
- Protect the few remaining undeveloped areas of lake and pond frontage.
- Maintain public access to Gilmanton's lakes and ponds and the Suncook River.
- Prevent the spread of exotic aquatic plants to uninfected lakes and ponds through education and by monitoring at boat launches.

## **5.0 WETLANDS**

Wetlands, as defined by the Environmental Protection Agency, the NH Department of Environmental Services and the Gilmanton Zoning Ordinance are those areas that are inundated or saturated by surface or groundwaters at a frequency and duration sufficient to support and that under normal circumstances do support a prevalence of vegetation adapted for life in saturated soil conditions. Thus a wetland is defined by the three "H's": hydrophytes or wetland vegetation, hydrology and hydric soils.

Wetlands are an integral part of Gilmanton's natural resources. They are important for removing excess nutrients and sediment from the water, slowing and storing floodwaters, promoting groundwater infiltration, and providing habitat for a variety of vegetation and animal life. In addition, wetlands provide recreational, educational and research opportunities. They add to the visual resources of the Town, especially in the fall when the red maples turn scarlet. Wetlands are most often found along streams and adjacent to ponds and lakes. They can be found in clustered complexes that are of great value. Vernal pools are a special type of wetland that dry out completely in the summer and have no fish population. They are especially valuable for amphibian reproduction, but have not been mapped for Gilmanton. Please see Section 6.0 of this report for more information on vernal pools.

There is a diversity of wetland types in Gilmanton, including areas of open water with emergent vegetation such as cattails, forested wetlands, and scrub-shrub wetlands. The principal types of wetlands with standing water in the spring have been mapped from aerial photos by the National Wetlands Inventory (NWI) of the U.S. Fish and Wildlife Service. The NWI wetlands do not include all wetlands, particularly those that do not typically have standing water in the spring. Therefore, this is an underestimate of the amount of wetlands. The more significant, wetlands, however, are included in the NWI.

The NWI classification codes for Gilmanton are shown on Figure 4, the Surface Water Features Map. These codes describe the dominant vegetation type as well as the hydrology of each wetland. For the purposes of this map, these codes were categorized by the dominant vegetation type.

- **Emergent wetlands** are those wetlands with non-woody vegetation that grows above the land and/or water surface. Cattail marshes are one example of emergent wetlands.
- **Forested – deciduous wetlands** are wetlands with deciduous trees as the dominant vegetation type. Red maple swamps are one example of forested – deciduous wetlands.
- **Forested – evergreen wetlands** are wetlands with evergreen trees as the dominant vegetation type. Hemlock, balsam fir and white cedar are examples of evergreen trees that might be dominant in a forested – evergreen wetland.
- **Forested – dead wetlands** are wetlands where a once forested wetland has been flooded (usually by a beaver impoundment) and the standing trees are dead. These wetland types often become nesting areas for great blue herons until the trees fall down and the impounded water becomes densely vegetated.
- **Deciduous – shrub wetlands** are wetlands where the dominant form of vegetation is deciduous shrubs. Highbush blueberry, silky dogwood, sweet gale and winterberry are common deciduous shrubs in Gilmanton wetlands.
- **Evergreen – shrub wetlands** are relatively uncommon. These wetland types are dominated by shrubs that do not lose their leaves. Leatherleaf and labrador tea are broadleaf evergreen shrubs. Other evergreen shrubs might be balsam fir, black spruce and other evergreen trees that have not yet reached tree size.
- **Unconsolidated bottom wetlands** are those wetlands with open water over most of the surface area of the wetland. Vegetation may grow in these wetlands below the surface of the water and/or may float on the water but is typically not visible early in the growing season when the aerial photography used to classify wetland types is taken.

The areas and number of each wetland type in Gilmanton are shown below in Table 4. The wetlands count does not reflect separate wetlands, but patches of wetlands classified as a particular type. The total area for NWI wetlands in Gilmanton is 1679 acres or 4.4% of the town's land and water area.

**Table 4 National Wetland Inventory Wetlands in Gilmananton**

Wetland Type	Count	Acres
Emergent (e.g. cattails)	153	522
Forested - Deciduous	187	287
Forested - Evergreen	79	186
Forested - Dead/Beaver Impoundment	34	89
Deciduous - Shrub	173	287
Evergreen - Shrub	3	3
Unconsolidated Bottom	155	305
<b>Total NWI Wetlands</b>		<b>1679</b>

In Gilmananton, as elsewhere, wetlands are being filled in, particularly for building roads and driveways to access building sites. Development has additional negative impacts on wetlands through increased runoff, erosion and sedimentation, fertilizers and pesticides on lawn and garden areas and removal of natural vegetation in adjacent upland areas. Table 5 below shows the increase in new residential construction since 1996. Note that the average number of residential building permits for a four year period nearly tripled from the 1996-1999 period to the 2000-2003 period.

**Table 5 Residential Building Permits in Gilmananton**

Year	1996	1997	1998	1999	2000	2001	2002	2003
Permits	16	13	20	25	40	44	59	55

Four year average 1996-1999 is 18.5 residential permits per year.  
Four year average 2000-2003 is 49.5 residential permits per year.

### 5.1 Significant Wetlands

A comparative study of the functions and values of the different wetlands in Gilmananton has not been undertaken. Such an analysis would be necessary to prioritize significant wetlands in the Town and to provide the data necessary to designate some wetlands as Prime under RSA 482-A: 15. These wetlands, when designated as such, receive special consideration from the Wetlands Bureau of NHDES. When a wetland is designated as Prime by a community, it is recognized as a valued natural resource, and protected as such. Additional information on Prime Wetlands can be found in Appendix B.

Although Gilmananton's wetlands have not been carefully studied, much information is available from the National Wetland Inventory maps. Based on these maps, the largest wetlands and wetland complexes in Gilmananton are shown on Figure 4, the Surface Water Features Map, and are found in the areas listed in Table 6. It is important to note that all of these wetlands are located in the headwaters of larger watersheds and thus, the effects of management policies for these wetlands will have impacts in other towns within these larger watersheds especially with respect to the quality of surface waters; aquifers and public drinking supplies.

**Table 6 Gilmananton's Large Wetlands and Wetland Complexes**



Name	Location
Ayers Brook Wetlands	Upper reaches of Ayers Brook near the Foss Family Farm and the Ayers Brook Town Forests.
Bean Road Wetlands	On fork of Academy Brook and including wetlands to the southwest of the Jones Farm Conservation Area.
Beaver Pond and Associated Wetlands	On Rt. 140 opposite school including wetlands to the southwest of the Cogswell Mountain Conservation Area.
Hidden Valley Wetlands Complex	Below the outlets from Manning Lake and Lake Eileen.
Kelley Meadows/ NH Route 107	Large beaver meadow northwest of Kelley's Corner.
Kimball Brook Wetlands	Along length of brook in Gilmanton near Rt. 107.
Nelson Brook Wetlands Complex	Tributaries and marsh feeding into Crystal Lake from northwest.
Nighthawk Hollow Brook Wetlands Complex	North of Rt. 140 along most of brook extending to the beaver pond on Middle Route.
Parsons Hill Wetland	South of Rt. 107 near the Barnstead townline.
Suncook Flats Wetlands Complex	Along lower sections of Ayers Brook and Nighthawk Hollow Brook near Stage Rd.
Townline Wetland	Along Loudon line near NH Rte. 129.

## 5.2 Wetland Buffers

In addition to retaining the wetland itself, the undeveloped uplands surrounding the wetland are also essential for a healthy wetland. Maintaining a buffer of a naturally vegetated upland area adjacent to wetlands and surface waters is important to reduce the adverse effects of human activity on these water resources. Vegetation in buffers intercepts rainfall, slows meltwater and promotes infiltration. Even unprotected small, intermittent streams can be sources of sediment and can contribute to large fluctuations in water levels downstream. In addition, a vegetated buffer provides habitat for species dependant on the wetland system and travel corridors for larger mammals. A minimum upland buffer width around wetlands and other shorelines of 100 feet is recommended and 300 feet is desirable to maintain good habitat.<sup>3</sup>

Shorelines of lakes, ponds, rivers and streams are called riparian areas, corridors, or buffers. Wider, forested buffers along these areas are more effective than narrow, grassy

<sup>3</sup> Chase, Victoria et. Als Buffers for Wetlands and Surface Waters, Office of State Planning, Audubon Society of New Hampshire, UNH Cooperative Extension, 1995, revised 1997.

ones according to *Introduction to Riparian Buffers*; Connecticut River Joint Commission for NH and VT, September 2000. This same report offers the following buffer requirements as seen in Table 7.

**Table 7 Riparian Buffer Requirements**

<b>Function</b>	<b>Buffer Width, Feet</b>
Stabilize banks	35 – 50'
Filter sediment	35' if slopes less than 15%
Filter dissolved nutrients & pesticides	100' to 500'. 100 feet removes about 60% of pollutants.
Protect fisheries	At least 100'
Protect wildlife	300' minimum
Flood control	Varies with size

It is important to note that the buffer should be wider if the adjacent land is sloped, if the land use is intensive, if the soils are erodible, if the land is a floodplain and if the stream or river naturally meanders.

### **5.3 Wetland Recommendations**

- Include a Wetland Ordinance in the Gilmanton Zoning Ordinance with provisions for a naturally vegetated buffer adjacent to wetlands, vernal pools and surface waters and with protection of steep slopes adjacent to wetlands. Some issues to consider when drafting such an ordinance include:
  1. Which wetlands and water resources to include?
  2. What should be surrounded by a protective buffer?
  3. How large should the buffer be?
  4. Should the buffer size vary depending upon the use?
  5. Should the buffer size vary depending on the significance of the wetland or water resource?
  6. What uses and activities should be permitted in the buffer?
  7. What should be done about pre-existing uses and lots?
  8. What should be done about exceptions and who makes that decision?
- Educate the public as to what they can do to protect wetlands and why. This should include the importance of reducing non-point source pollution from sedimentation, fertilizers, pesticides, and hazardous wastes.
- Continue to work with the Wetlands Bureau of NHDES to enforce State laws and rules.
- Conduct a comparative study of wetlands in Gilmanton.
- Consider Prime Wetland designation for some wetlands.
- Amend the Gilmanton Subdivision regulations to require that wetlands be mapped by a certified wetland scientist for all subdivision applications.
- Amend the Gilmanton Site Plan regulations to require that wetlands be mapped by a certified wetland scientist for all site plan applications.

## 6.0 VERNAL POOLS

Little is known about the number and location of vernal pools in Gilmanton. Given their importance for maintaining biodiversity, this is unfortunate. One of the problems is that vernal pools are not easy to identify for most of us and people need to know what to look for. Although vernal pools may vary in size from a few square feet in area to over a number of acres and may be located in a number of different sites – woods, floodplains or gravel pits—they do have certain features in common. Although they appear in the same place year after year they are defined as a temporary body of water because most dry up in hot weather or times of drought. All of them are contained bodies of water without any permanent outflow.<sup>4</sup> They do not support fish and are therefore excellent breeding grounds for species whose eggs would provide an excellent food source were fish present. Some species are so dependent on vernal pools for their survival that their very presence is taken to establish that a particular basin of water is indeed a vernal pool. Not surprisingly, these are known as indicator species.

An essential inhabitant of vernal pools is the fairy shrimp. These are tiny crustaceans that are found throughout the country. They are present as soon as a vernal pool thaws and die off at the start of warm weather, leaving their eggs on the floor of the pool. These are designed to survive drying out, intense heat, freezing, and even being eaten by birds and, despite everything, will hatch the following spring when the pool is once again filled with water. Should there be a dry spell that prevents this from occurring, the eggs are prepared to wait out the weather.

Some amphibians are also indicator species of vernal pools. Indicator species in New Hampshire are the spotted salamander and the wood frog. Wood frogs are one of the earliest creatures to be seen in the spring often appearing in March and their early mating makes it possible for the eggs to develop before the pool dries up. The wood frog call sounds very much like the quacking of ducks and is an early sign of spring. This frog is brown with a black mask, and is often seen in the woods during the summer.

Spotted salamanders lay their eggs in vernal pools as well and migrations of salamanders to breeding areas usually take place after the first heavy rain in early spring. Although both the spotted salamander and the wood frog may be found mating in more permanent waters, eggs laid in vernal pools have the best chance of surviving. The spotted salamander will often lay her eggs in October and, if the pool is still dry, will stay with them keeping guard until Fall rains arrive.

Many other species use vernal pools although they do not have the same dependency upon them. Among the invertebrates, these are clam shrimp, fingernail clams, and amphibious snails, caddis flies and other aquatic insects. Among the amphibians the species are four-toed salamander, Eastern newt, spring peeper, American toad, the gray treefrog, and the green frog. Although no reptile is among the indicator species, the spotted turtle, the earliest turtle to appear in the spring, sometimes moving about in March, often uses such pools as a source of food and a place for courtship and mating. Blanding's turtles have been known to overwinter in vernal pools. Both

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<sup>4</sup> Information for this segment of the Natural Resource Inventory comes from *Identification and Documentation of Vernal Pools in New Hampshire*, ed. Anne Tappan (New Hampshire Fish and Game Department Nongame and Endangered Wildlife Program, 1997).

of these species are endangered in New Hampshire and their appearance is of special interest to the Non-Game and Endangered Species Division of New Hampshire Fish & Game. In fact, if you think you may have a vernal pool on your property, it is possible to obtain a documentation form from Fish & Game and they would welcome a report on the sighting of any of the reptiles or amphibians mentioned here. Such reports may also be given to the Audubon Society of New Hampshire.

If you think you have a vernal pool on your property try to identify it while causing as little disturbance as possible. A trip to the pool at night should enable you to hear the wood frogs quacking in early spring and following a spotted salamander migration will eventually lead you to such a pool. Day time exploration would consist of finding the eggs of these amphibians. Wood frog eggs lack a surrounding gelatinous capsule and do not look as though they are holding a consolidated shape. They are attached to twigs just below the surface of the pond. Salamander eggs are surrounded by a firm jelly-like substance with individual eggs visible inside. The egg mass is attached to sticks, grass, weeds or reeds usually eight to ten inches below the surface. The upper part of the egg is dark brown or gray and the lower part dirty white or dull yellow. Adults of these species may also be seen. It is, of course, essential to disturb the animals as little as possible in your effort to identify a vernal pool. In reporting such findings to the Nongame and Endangered Wildlife Program at 2 Hazen Drive in Concord (603-271-2462) photographs of the site would be enormously helpful.

## **6.1 Vernal Pool Recommendations**

Vernal pools provide a unique type of wildlife habitat and are crucial breeding grounds for a number of amphibians. As such, efforts should be made to protect this habitat and the species that it supports. Some methods to accomplish this goal include:

- Identify and map vernal pools on subdivision plans and site plans in order to provide an opportunity to mitigate the impacts to these sensitive areas;
- Education;
- Keep log landings, roads and trails out of vernal pools and the area adjacent to them. Busy roads near a vernal pool can lead to massive annual mortality and local extinctions;
- Maintain shade around a vernal pool in order to keep it from drying up too quickly and to maintain water temperatures;
- Keep slash out of a vernal pool during forestry operations and during development;
- Maintain the upland (non-wetland) habitat where many vernal pool dependent species spend most of their life cycle.

## 7.0 GROUNDWATER AND DRINKING WATER

Gilmanton's residents rely upon groundwater for their drinking water. Most wells are drilled into bedrock or dug into glacial till.

### 7.1. Aquifers and Aquifer Recharge

An aquifer can be defined as a formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs. There are bedrock aquifers and sand and gravel aquifers with the latter being the most productive. A small portion of the town consists of sand and gravel aquifers. These are glacial deposits of sand and gravel that hold significant amounts of water in the pore spaces between the particles of sand and gravel. This groundwater is continuously replenished by rain and other surface waters.

Groundwater, especially in sand and gravel aquifers, is vulnerable to contamination, most often from leaking underground storage tanks, poorly maintained septic systems, improper disposal of hazardous chemicals, or vehicle accidents. Gravel pits are often located in or over aquifers. Land over aquifers tends to be favored for development because it is relatively level and easily excavated. The identification and careful monitoring of land uses near aquifers is important. Gilmanton's four sand and gravel aquifers are listed in Table 8.

**Table 8 Gilmanton's Sand and Gravel Aquifers**

Name	Aquifer Size (acres)	Acres in Gilmanton	Percent in Gilmanton
Crystal Lake Aquifers	626	486	78%
Kimball Brook and Rocky Pond Aquifers	Data not available	47	Data not available
Suncook Flats Aquifer	987	733	74%
Sargent Lake Aquifer	60	22	37%

Sand and gravel aquifers in Gilmanton are shown on Figure 5, the Drinking Water Resources Map. The ability of an aquifer to supply water is called transmissivity and is measured in ft<sup>2</sup>/day. Most of the aquifers in Gilmanton have a transmissivity of 1000 ft<sup>2</sup>/day or less and are not considered adequate for a public water supply. There are 23 acres near Burke Road and approximately 120 acres near Crystal Lake with a transmissivity of 2000–4000 ft<sup>2</sup>/day. The most productive aquifer is by Crystal Lake in the area of Pine Circle, Glen Echo Road and Boat Ramp Road. A small 4 acre area by Pine Circle has a transmissivity greater than 8000 ft<sup>2</sup>/day and the remaining 137 acres has a transmissivity of 4000–8000 ft<sup>2</sup>/day. Unfortunately, there is already considerable development around the best future water supply locations.

Aquifer recharge is the process by which rainwater and snowmelt seeps down through the soil into an underlying aquifer. Many natural processes determine how much of the water

actually reaches the aquifer and how much evaporates, is consumed by plants and animals or runs off the ground surface into surface water bodies. Much attention has been directed to the importance of protecting surface waters and wetlands from filling and contamination, but there has been much less effort directed towards protecting critical aquifer recharge areas. These are areas where contamination would directly impact potable water supplies in the aquifer. In addition to eliminating contamination sources, water must be allowed to seep into the ground in order to protect both the quality and the quantity of water in an aquifer. Requiring new development to retain all stormwater and melt water on site will help to maintain pre-development levels of recharge. A useful publication in this regard is *Managing Stormwater as a Valuable Resource*, NH DES, 2001.

## **7.2 Public Water Supplies**

According to NH DES as of November, 2003, Gilmanton has the following public drinking water supplies: Hidden Valley Boy Scout Camp, the Gilmanton School, the Old Town Hall, Centre Congregational Church, United Church of Christ, Chamberlain Hill Day Care and the Crystal Springs Condos. Figure 5, the Drinking Water Resources Map shows a Drinking Water Protection Area around two of these wells, one for the Gilmanton School and one for the Crystal Springs Condos. The Protection Area for Crystal Springs Condos encompasses 122 acres and that for the Gilmanton School is 162 acres. Ideally, this area should be protected from any potential contamination in order to ensure the quality of the well water. Part of the Gilmanton School Protection Area is in the Cogswell Mountain Conservation Area.

A Drinking Water Source Assessment Report for Gilmanton has been prepared by NH DES. This report assesses the vulnerability of each public water system to contamination. For example, the Gilmanton School received highly vulnerable ratings in the following categories: within 1000' of a state highway, pesticide application within 500' of the well, proximity to a septic system, amount of agricultural land within the wellhead protection area and inappropriate land uses near the well. This report and the Environmental Fact Sheet *Protecting Public Drinking Water Sources Based on Source Assessment Reports* can be found in Appendix C.

## **7.3 Contamination Sources**

Known and potential contamination sites have been mapped by the NH Department of Environmental Services (NHDES) and are shown on Figure 5, the Drinking Water Resources Map. The known sites are locations where contamination of the soil or groundwater has occurred and has been cleaned up or is being monitored by NH DES. Some of these sites include the former town dump in the Iron Works, the former landfill on Rt. 107 and a leaking underground storage tank at the Gilmanton School. A complete listing of these sites is in Appendix D.

Potential contamination sources include underground storage tanks, facilities that generate hazardous waste, large junkyards and point/non-point potential pollution

sources. Point/non-point potential pollution sources include the Town salt shed on Currier Hill Road and the State DOT facility on White Oak Road which is located over an aquifer. Appendix D contains a complete listing of potential contamination sources.

#### **7.4 Impervious Surfaces**

When a watershed is increasingly covered with pavement, buildings, and other compacted surfaces that are impervious to water, significant changes in water quality and quantity result. When rain falls on impervious surfaces, it runs off faster into surface waters, carrying with it sediment and pollutants from road surfaces, lawns, construction sites, and parking lots. Flooding, warming, and channelization of streams results. Infiltration of rainfall into the ground to replenish groundwater is reduced.

This type of run-off, called “non-point source pollution” is now the most serious threat to water quality for New Hampshire and for Gilmanton. Construction and site designs that promote retention and infiltration of rainwater and runoff, narrower streets and driveways when possible, shrub and tree buffers to waterways, and more compact development patterns can protect Gilmanton’s water quality and quantity as the town grows.

Studies conducted in the northeast have documented that by converting as little as 10% of a watershed to impervious surfaces, stream water quality and organisms begin to deteriorate. Above 25% impervious surface, water quality is seriously degraded. The Lakes Region Planning Commission studied the degree of impervious surface cover in the Gilmanton Corners area, using 1993 land cover data. The analysis showed that the average impervious surface cover was 11% for the village area. It is likely that the result would be similar for the Iron Works Village and would be much lower for the remainder of the town, with the exception of the commercial area along Rt. 106.

#### **7.3 Groundwater and Drinking Water Recommendations**

- Include an Aquifer Protection Overlay Zone in the Gilmanton Zoning Ordinance.
- Require that stormwater and melt water be retained on site when land is developed.
- Modify the Gilmanton Zoning Ordinance to prohibit or restrict new potential contamination sources from locating in a wellhead protection area.
- Establish a household hazardous waste collection program that is easier for residents to access.
- Gilmanton should continue to keep the town-owned land on Pine Circle due to the productivity of the underlying aquifer.
- The Town should consider acquiring land over and adjacent to productive aquifers in order to protect future municipal water supplies.
- Educate the public as to what they can do to protect groundwater. This should include the importance of reducing non-point source pollution from fertilizers, pesticides, and hazardous wastes. The public should also understand the importance of aquifer recharge.

## 8.0 AGRICULTURAL RESOURCES

In 1840 Gilmanon produced more wheat, dairy products, cattle and hay than any other town in New Hampshire.<sup>5</sup> Gilmanon's early history and remaining stone walls attest to the town's rural roots.

Agricultural land is valued in Gilmanon for the food that its farmers produce, some of which is locally available. It is also valued for its scenic beauty and diverse habitat. Gilmanon's farmers and farm families help other residents connect with the town's rural heritage and promote better land management. Much of the character of the town we owe to those who have sustained their farms and agricultural lands for generations.

### 8.4 Farms

The amount of land in agricultural use in Gilmanon was estimated to be 1500-2000 acres, about 4-5% of the town, in 1993. Since then some agricultural lands have been developed. The tables below are based on personal interviews and information currently available. They are estimates of the amount of land used for farming and agriculture. There is undoubtedly unlisted additional land throughout Gilmanon being used for food production and haying activities.

These farms and agricultural operations are an active and important part of Gilmanon. In addition to their own farms, some of these farmers maintain fields held by others.

Based on the survey results from the tables below, 2391 acres, about 6-7% of the town is estimated to be in agricultural use in 2004. An analysis of 2001 Landcover data shows that 0.01% of the town was in orchard, 0.31% was in row crops and 4.97% was in hay/pasture.

As in many areas throughout the state, there is a trend toward specialized and home based agricultural operations such as roadside stands etc. which offer produce, plants and flowers.

A map showing the approximate location of the farms in Table 9 follows the table.

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<sup>5</sup> Notes and Excerpts from Lancasters History of Gilmanon, 1845, pg.19.



**Table 9 Commercial Farms in Gilmanton**

<u>Name</u>	<u>Product</u>	<u>Acres</u> <b>(Approximate)</b>
Bosiak Farm, Upper City Road	Dairy, hay, corn	157
Clark (Meadowview Farm) Currier Hill Road	Sheep, chickens, hay	70
Dawson Farm, Stage Road	Hay, maple syrup	130
Gallant Farm, Stockwell Hill Road	Horses, hay, maple syrup	95
Geddes Farm, Geddes Road	Maple syrup, hay, beef cattle, blueberry barrens	35
Kardinal Farm, Halls Hill Road	Blueberry barrens, hay	200
Maltais Farm, Middle Route	Plants, seedlings, vegetables	2
Peaked Hill Farm, Province Road	Blueberries, raspberries, vegetables, produce (organic)	6
Perkins Farm, Perkins Road	Dairy, corn, eggs, hay	165
Potter Farm, Potter Road	Beef cattle, corn, hay, maple syrup	330
Price Farm, Shannon Road	Dairy, corn, hay, maple syrup	510
Sanborn Farm, Upper City Road	Dairy, corn, hay	103
Sunnyside Maples, Meadow Pond Road	Blueberries, maple syrup, hay	85
Warburton Farm, Beauty Hill Rd.	Heifers, corn, hay	160

**Table 10 Residents Using Land for Non-Commercial Agricultural Purposes**

<b>Name</b>	<b>Product</b>
Baldwin, Pancake Hill Road	Hay
Bartlett (Stoneberry Farm), Griffin Road	Beef cattle, pigs, chickens, horses, hay, vegetables
Boyd, Durrell Mountain Road	Sheep
Brown, Allens Mill Road	Tree farm
Davies (Heart Song Farm), Tibbetts Road	Goats, cheese
Fanning, Prescott Hill Road	Beef cattle, hay
Foss (Pleasant Valley Farm), Meetinghouse Road	Hay
Guarino (Lofty View Farm), Meetinghouse Road	Herbs
Hasler (Fox Farm), Buzzell Road	Sheep, fleece, organic vegetables
Hatem (Fernwood Farm), Stage Road	Organic produce, berries, herbs, flowers
Kelley, NH Routes 107 & 129	Corn, hay
McWhinnie, Meetinghouse Road	Hay
O'Flaherty, Sargent Road	Horses, hay, maple syrup
Robinson, Currier Hill Road	Horses
Robertson, Sargent Road	Sheep, hay
Twigg, Province Road	Hay

It should be noted that the above is not an inclusive list as there are numerous other residents unknown to us who have horses, goats, chickens and other livestock. In addition, many people raise vegetables, fruit and herbs for their own consumption and to share with their neighbors. The above table does not include a number of residents involved in ornamental horticulture. The Gilmanton Farmer's Market was begun in 2004 and plans to include more local growers in the future.

In order to get a more accurate understanding of the value of agriculture to Gilmanton, the Town should complete an Agricultural Profile. A copy of the fact sheet *Developing an Agricultural Profile for Your Town* is available from the UNH Cooperative Extension.

### **8.5 Agricultural Soils**

New Hampshire is losing its most productive farmland. Between 1982 and 1997, nearly 12,000 acres of prime farmland became unavailable for production of crops, feed, forage or fiber. Most was lost to urban and rural development. Only 2% of New Hampshire soils classify as prime farmland. (Prime Farmland: land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is also available for these uses.) Cropland, usually the most productive agricultural land, has declined 24% statewide from 1974 to 1997. No figures are available for Gilmanton, although Belknap County lost 6.9% of its land in farms between 1982 and

1997.<sup>6</sup> Discussions with survey participants indicate a growing concern with the future of Gilmanton’s rural heritage. Increasing expenses and lower profits are factors. The pressure from escalating development and rapidly increasing land loss through subdivisions is a major concern.

The soils maps for Belknap County are in the midst of an update and are only available in draft form. Thus, it is not possible to have a map showing these updated prime farmland soils in Gilmanton at this time. However the following soils series from the revised mapping have been listed as being prime farmland in Belknap and Merrimack Counties.

**Table 11 Prime Farmland Soils in Belknap and Merrimack Counties**

<b>Soil</b>	<b>Name</b>	<b>Classification</b>
24A & 24B	Agawam Very Fine Sandy Loam, 0 To 8 Percent Slopes	All areas are prime farmland
56B	Becket Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
532B	Belgrade Very Fine Sandy Loam, 0 To 5 Percent Slopes	All areas are prime farmland
378A & 378B	Dixfield Fine Sandy Loam, 0 To 8 Percent Slopes	All areas are prime farmland
478A & 478B	Dixfield Variant, 0 To 8 Percent Slopes	All areas are prime farmland
27A	Groveton Very Fine Sandy Loam, 0 To 3 Percent Slopes	All areas are prime farmland
46B	Henniker Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
28A	Madawaska Fine Sandy Loam, 0 To 3 Percent Slopes	All areas are prime farmland
76B	Marlow Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
166B	Marlow Variant Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
44B	Montauk Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
513A & 513B	Ninigret Fine Sandy Loam, 0 To 8 Percent Slopes	All areas are prime farmland
1	Occum Fine Sandy Loam, Frequently Flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season
401	Occum Fine Sandy Loam, Occasionally Flooded	All areas are prime farmland
101	Ondawa Fine Sandy Loam,	Prime farmland if protected

<sup>6</sup> USDA Natural Resources Conservation Service, NRI 1997.

	Frequently Flooded	from flooding or not frequently flooded during the growing season
201	Ondawa Fine Sandy Loam, Occasionally Flooded	All areas are prime farmland
66B	Paxton Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
104	Podunk Fine Sandy Loam, Frequently Flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season
4	Pootatuck Fine Sandy Loam, Occasionally Flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season
446B	Scituate-Newfields Complex, 3 To 8 Percent Slopes	All areas are prime farmland
558B	Skerry Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
458B	Skerry Variant Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland
29B	Woodbridge Fine Sandy Loam, 3 To 8 Percent Slopes	All areas are prime farmland

## 8.6 Agriculture Recommendations

Agriculture is important to Gilmanon in many ways. The commercial farms contribute to the town economically and the Town's residents are fortunate to enjoy locally grown produce, fruit, dairy products, meat, maple syrup and Christmas trees. The open fields and farm structures are a part of the rural character that is so important to the Town. This is an important resource to be protected. Some recommendations to help sustain economically viable agriculture in Gilmanon are:

- Complete an Agricultural Profile for the Town;
- Educate the public that once important farmland soils are developed they are lost forever;
- Protect the Important Farmland soils that are necessary for economically viable agricultural activities. Once developed, these soils are lost forever. These soils are shown on a 1975 Belknap County "Important Farmlands" map. This map has not yet been updated to reflect the most recent soil survey for the county. Once updated, this map should be included in an updated NRI;
- Reduce conflict between agricultural and residential uses by requiring a buffer when land is developed adjacent to a farm;

- Support legislation economically beneficial to small agriculture, provided the legislation does not have a negative ecological impact;
- Encourage residents to “buy local”;
- Educate farmers about the benefits of conservation easements on their property;
- Encourage farmers to follow “Best Management Practices” in the management of their farm.

## **9.4 FOREST RESOURCES**

Gilmanton’s forests provide valuable habitat for plant and animal populations. The forests absorb rainwater, increase groundwater infiltration, and buffer surface waters from sedimentation and contamination. Near roads and homes, trees cool summer temperatures by 10 degrees or more, break winter winds, and filter dust and pollutants from the air. Forests host scenic recreational trails and hunting grounds. Our tourist industry and seasonal residents are attracted by healthy forests. In addition, well-managed forests provide a sustainable supply of maple syrup, home firewood and commercial wood products and jobs needed by New Hampshire residents.

### **9.1 Forest Cover**

A forest is not merely a stand of trees. It is the total assemblage of trees; the substrate (soil or rock) on which they depend for anchorage and support, nutrition, moisture, and supply of oxygen to the roots; the other plants with which they interact in terms of mutual shelter, competition, benefit or antagonism; the animals that feed on, shelter under, or benefit the plants; the microorganisms that exert direct or indirect beneficial or antagonistic effects on the trees and other living organisms; and the soil and atmospheric climate, including fire and moisture, that influence the distribution and abundance of all the organisms in the forest.

A forest is comprised of several forest types. Forest types are distinctive associations or communities of trees, shrubs, and herbaceous plants. They are named for the predominant tree species occurring in the type. Common forest types in Gilmanton include White Pine; Northern Hardwood (sugar maple, beech, yellow birch, red maple, white ash and smaller amounts of other species); Spruce-Fir, Red Oak, Hemlock, and Aspen-Birch. A forest type may be dominated by a single tree species or it may be dominated by several species growing together.

Gilmanton’s forests provide us with wood and food products, wildlife, scenic beauty, a modified microclimate, stabilization of steep slopes and snowpacks, the control of water flows, the creation and maintenance of stream habitat for aquatic animals, and recreation. In addition, forests constitute a major storage of carbon not only in the trees themselves, but in the forest soils as well. Most importantly, forests provide us with biodiversity.

NH is the second most forested state in the US trailing Maine. Gilmanton is approximately 84% forested which is equal to the state average.<sup>7</sup> Many of Gilmanton's forests have grown from abandoned agricultural land and are now mature. However, due to increased development, the area of Gilmanton's forests is decreasing.

An analysis of 2001 Land Cover data produces a smaller figure for the percentage of the Town that is forested. The Land Cover for various forest types can be seen in Figure 3, the Land Cover Map. The percentages for various forest types are shown in Table 12 below.

**Table 12 Forest Land Cover**

Land Cover	Acreage	Percentage
Mixed Forest	13087.69	34.33
Beech/Oak	8386.42	22.00
Other Hardwoods	4365.10	11.45
White/Red Pine	3118.59	8.18
Hemlock	967.75	2.54
Spruce/Fir	595.86	1.56
Paper Birch/Aspen	184.24	0.48
Forested Wetlands	122.22	0.32
Pitch Pine	3.41	0.01
<b>Total</b>	<b>30831.28</b>	<b>80.86</b>

## 9.2 Forestry

Forestry provides an important revenue source to the town, and if forests are sustainably managed, this can be an ongoing, stable income stream for landowners as well as the town. In 2003, Intents to Cut forms were filed for approximately 1035 acres in Gilmanton. The Town receives a timber tax which is based on 10% of the value of timber harvested. Table 13 shows the timber tax received in each of the past 5 years.

**Table 13 Timber Tax**

Year	Amount
2003	\$16,419
2002	\$17,646
2001	\$41,443
2000	\$33,710
1999	\$22,000

<sup>7</sup> NH Division of Forest and Lands

Responsible timber harvesting helps landowners afford to keep their forests as forests and provide many benefits for Gilmanton as well. Currently there are thirteen landowners holding 4593 acres or 10.9% of the town who have enrolled their land in the American Tree Farm System.<sup>8</sup>

A Tree Farm is a privately owned forest managed to produce timber with added benefits of improved wildlife habitat, water quality, recreation, and scenic values. Town Forests and other publicly owned land may also be certified as a Tree Farm. To qualify, a landowner must:

- Dedicate at least 10 acres to growing and harvesting forest products;
- Have a written plan for the future management of their forest;
- Follow management recommendations prescribed by a licensed forester;
- Demonstrate a commitment to stewardship of their forest for multiple values.

In addition to land that has been officially designated as a Tree Farm, there are many acres that are actively managed under a Forest Management Plan written by a Licensed Professional Forester. Foresters provide a variety of services to landowners including management plan preparation, timber appraisals, timber sale administration, wildlife habitat improvement, boundary marking, timber stand improvement, and recreational and aesthetic improvements. A list of Licensed Professional Foresters is available from the Cooperative Extension office.

### **9.3 Forest Soils**

Forest soils have a range of productivity for different types of tree species and suitability for management. Forest Soils in New Hampshire have been classified for their productive value and operability as shown in Table 14. The IA, IB and IC soils are the most valuable for ecologically sensitive and economically viable forest management. The updated soils maps for Belknap County are available only in draft form and have not been digitized. Thus, a calculation of areas to include in the following table has not been possible for this version of the NRI.

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<sup>8</sup> New Hampshire State Tree Farm Committee records, 2004.

**Table 14 New Hampshire Forest Soils Classification**

Soil Class	Description
IA	Deeper, loamy soils, moderately to well-drained (best northern hardwood sites)
IB	Sandy or loamy soils, moderately to well-drained (mixed hardwood sites)
IC	Outwash sands and gravels (best pine sites)
IIA	IA and IB soils with limitations such as steepness, shallow to bedrock or rocky
IIB	Poorly drained soils
Unclassified	Unclassified: Muck and peat, rock outcrop, gravel pits, marsh

## 10.0 TOWN FORESTS

Gilmanon is fortunate to have 9 Town Forests totaling approximately 552 acres. In addition to the Town Forests, Meadow Pond State Forest, Page State Forest, Sanborn State Forest and a part of Belknap Mountain State Forest are located within the Town. Gilmanon's Town Forests are listed in Table 15 according to acreage.

**Table 15 Gilmanon's Town Forests**

Town Forest	Size, Acres
Elizabeth R. "Betty" Smithers Town Forest	210.68
Thompson Town Forest	122.7
Pine Hill Town Forest II	63.1
Ayers Brook Town Forest IV	55
Nelson Brook Town Forest	47
Pine Hill Town Forest I	27.5
Ayers Brook Town Forest II	21
Ayers Brook Town Forest III	5
Schoolhouse Pond Town Forest	0.25

### 10.1 Management Plans

At the Town Meeting held in March 2003, Gilmanon approved \$4,000 for the hiring of a consulting forester so the process of managing our forests could begin. The members of the Gilmanon Conservation Commission have hired Brenda Brown of All Seasons Forestry Consultants as the Town's Consulting Forester. Ms. Brown has walked all but one of the Town Forests and, based on her reports, the Conservation Commission has



decided that the first forest management plan should be developed for the Thompson Town Forest at the end of Gale Road. A map of this Town Forest was completed for the March, 2004 Town Meeting. The main goals of the management plans are to promote forest health; protect sensitive areas such as wetlands and vernal pools; and improve wildlife habitat and recreational opportunities.

The management plan will include a schedule of management priorities. Specific recommendations will be given for each forest. The plans are reviewed and updated every 5-10 years or on an as needed basis such as wildfire or insect infestation. A public workshop will be presented each time a management plan is revised or timber harvests are planned.

## **10.2 Goals and Objectives**

The Commission has established the following goals and objectives for the Town Forests:

A. Maintain the structural, functional, and compositional integrity of the forest as an ecosystem through:

- Maintenance of soil productivity;
- Protection of water quality, wetlands, and riparian zones;
- Maintenance or improvement of the overall quality of forest products;
- Conservation of scenic quality;
- Protection of unique or fragile natural areas;
- Protection of unique historic and cultural features;
- Conservation of native plant and animal species and their habitat.

B. Meet the diverse needs of the human community through:

- Sustainable flow of timber, pulpwood and other forest products;
- Improvement of the overall quality of the timber resource as a foundation of more value added opportunities;
- Addressing aesthetic impacts of forest harvesting;
- Continuation of opportunities for traditional recreation.

## **10.3 Survey Results**

Surveys concerning opinions about the Town Forests were distributed at Town Meeting, 2003 and at the Town Hall after Town Meeting until May 1, 2003. There were 44 responses from Town Meeting and 17 from the Town Hall for a total of 61. The most significant differences between responses from Town Hall and Town Meeting are:

- Town Hall responses were significantly more in favor of ATV;
- Town Hall responses were more opposed to snowmobile use;
- Town Hall responses were more supportive of hunting;

- 79% of Town Meeting responders were aware of the Town Forests, but only 43% of the Town Hall responders were aware;
- 5% of Town Meeting responders used the Town Forests for ATV riding, but 47% of the Town Hall responders did.

Are you aware of the ten Gilmanton Town Forests?                      70% Yes                      30% No  
 If you have visited any of the Town Forests, how would you describe your use? Please check all that apply.

53% Walking                      17% Mountain Biking                      3% Snowmobile                      15% ATV  
 12% Fishing                      17% Horseback Riding                      20% Hunting  
 17% Bird Watching                      27% Skiing/Snowshoeing                      3% Other

The following statements are rated from “strongly agree” to “strongly disagree” with 1 being “strongly agree” and 5 being “strongly disagree”. The “score” is an average of the responses for that question.

Rank	Score	Question
1	1.19	It is important that our Town Forests support game species (deer, turkey, grouse).
1	1.19	Our Town Forests should be managed to support a diverse stand of timber and wildlife population.
2	1.2	Our Town Forests should be used for environmental education programs in the schools.
3	1.45	The Town Forests should be managed for multiple use, including timber harvesting, wildlife habitat, natural resource education and passive recreation.
4	1.57	The Town Forests should be more accessible for public use (parking, trail maps, description of historical background).
5	1.63	It is important that our Town Forests support non-game species (amphibians, bobcat, fisher, mink, etc.).
6	1.73	The Conservation Commission should sponsor nature walks, historical tours and other educational programs in the Town Forests.
7	1.83	Our Town Forests should be used for horseback riding.
8	2.34	Hunting should be permitted in the Town Forests unless prohibited by state law.
9	2.43	Our Town Forests should be used for mountain bike riding.
10	3.12	ATV use is appropriate in areas that do not conflict with pedestrian use and do not have a negative impact upon wildlife habitat or wetlands.
11	3.36	Snowmobile use should be allowed.
12	4.64	Our Town Forests should be used primarily for timber production.

## 10.4 Town Forest Recommendations

- Insure access and parking for public use.
- Prepare Forest Management Plans by a licensed forester for all but the smallest of the Town Forests.
- Include some of the Town Forests in the American Tree Farm system. This would provide the public with an example of a managed forest.
- Survey and mark boundaries.
- Develop trail maps and make them available.
- Develop a Town Forest Ordinance and signage informing residents of how the Town Forests should and should not be used.
- Add adjacent parcels to the Town Forests when possible. Larger forest blocks are easier to manage and can be more productive.
- Consider placing a conservation easement on the Town Forests so that they are permanently protected.

## 11.0 NATURAL COMMUNITIES

The New Hampshire Natural Heritage Program defines a **natural community** as an assemblage of plants, animals and other organisms together with the natural physical environment in which they are found. Natural communities include different types of upland forests, grasslands, and wetlands, and they repeat on the landscape wherever suitable conditions occur. Gilmanton's natural communities not only play a practical and essential role in keeping our soil, water and air healthy – they provide us with diverse physical landscapes and scenic beauty.

Natural communities are defined by three characteristics:

- What plant species are present;
- The physical structure of the vegetation (short grasses vs. tall trees);
- The physical environment, which consists of the physical setting (pond shore or hillside), the water and nutrients present and the climate.

Natural communities are made up of living components that are closely interrelated and interact with one another and the environment. Humans are also a part of the living landscape and have a tremendous influence. Human disturbance of the natural environment is occurring at a faster pace than the natural communities can adapt to. It is vital we become aware of the natural communities we have in Gilmanton in order to protect them.

Nutrient-poor basin swamps; sandy pond shores; mineral-enriched swamps (including seepage swamps); and rich and semi-rich mesic forests are only a few of the natural communities occurring in Gilmanton. Examples of natural communities that can be considered to be ecologically exemplary are increasingly harder to find in New Hampshire. The New Hampshire Natural Heritage Bureau in Concord has fact sheets that define, describe, list plant species present, and provide conservation considerations for the Natural Communities of New

Hampshire. They may be contacted at [www.nhfdl.org/formgt/nhiweb](http://www.nhfdl.org/formgt/nhiweb) or 603-271-3623 for more information.

Protecting our natural communities is necessary to preserve the biological diversity of our Town and of New Hampshire. Biological Diversity, or **biodiversity**, is the variety and variability of all living organisms. This variety includes the diversity of plants, animals, fungi, algae, bacteria, and other microorganisms, their genetic variability, the natural communities in which they live, and the processes and interactions that weave the biological and physical elements of the planet into a complex web.<sup>9</sup>

## 12.0 PLANT COMMUNITIES

### 12.1 Rare/Imperiled Species

In 1987, the New Hampshire state legislature passed the Native Plant Protection Act (NH RSA 217-A) and formally recognized that "for human needs and enjoyment, the interests of science, and the economy of the state, native plants throughout this state should be protected and conserved; and their numbers should be maintained and enhanced to insure their perpetuation as viable components of their ecosystems for the benefit of the people of New Hampshire."

Currently, there are 288 species listed as endangered or threatened under the Native Plant Protection Act and that are tracked by the NH Natural Heritage Bureau. A complete listing of these species can be found on the NH Natural Heritage Bureau's website at [www.nhfdl.org](http://www.nhfdl.org) or by contacting them at Natural Heritage/DRED, PO Box 1856, Concord NH 03302-1856, 603-272-3623. Please contact them if you are aware of the location of any of these species, in order that the state-wide database may be made more complete. The Bureau has a policy of never releasing exact locations.

The Gilmanton Conservation Commission encourages input from residents should they find an unusual plant species or a unique natural community. The Commission may be reached by calling the Gilmanton Selectmen's office at 603-267-6700 or by mail at PO Box 550, Gilmanton NH 03237.

Endangered and threatened are defined under the NH Native Plant Protection Act as:

**Endangered species** are those in danger of being extirpated from the state;

**Threatened species** face the possibility of becoming "endangered".

The records of rare plant species in Gilmanton are very old and the current status and location of these species is unknown. The listings recorded at the New Hampshire Natural Heritage Inventory are shown in Table 16. A targeted botanical survey, with

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<sup>9</sup> *New Hampshire's Living Legacy, the Biodiversity of the Granite State*, NH Fish and Game Department, 1996.

landowner permission, might determine whether these species or other rare species and plant communities are present.

**Table 16 Historic Records of Rare Species in Gilmanton<sup>10</sup>**

Latin Name	Common Name	Date Observed	State Status
<i>Adlumia fungosa</i>	Climbing Fumitory	1877	Threatened
<i>Carex Bullata</i>	Inflated sedge	1861	Endangered
<i>Chenopodium boscianum</i>	Bosc's pigweed	1867	Endangered
<i>Chenopodium rubrum</i>	Coast-Blite Goosefoot	1867	Threatened
<i>Gentiana crinita</i>	Fringed gentian	1889	Threatened
<i>Potamogeton foliosus</i>	Leafy pondweed	1861	Endangered
<i>Prunus Americana</i>	American plum	1863	Threatened
<i>Quercus macrocarpa</i>	Mossy-cup oak	1955	

**Plants Listed as Special Concern.** In addition to recognizing "endangered" and "threatened" plant species, the NH Native Plant Protection Act identifies 11 plants as "special concern."

<i>Calopogon tuberosus</i>	Grass pink
<i>Cornus florida</i>	Flowering dogwood
<i>Cypripedium acaule</i>	Pink lady's-slipper
<i>Dicentra cucullaria</i>	Dutchman's breeches
<i>Epigaea repens</i>	Trailing arbutus
<i>Kalmia latifolia</i>	Mountain laurel
<i>Platanthera blephariglottis</i>	White fringed orchis
<i>Platanthera grandifolia</i>	Large purple fringed orchid
<i>Pogonia ophioglossoides</i>	Rose pogonia
<i>Rhododendron lapponicum</i>	Lapland rosebay
<i>Sarracenia purpurea</i>	Pitcher plant

These species are not rare in New Hampshire, but their showy nature makes them vulnerable to over-collection. The NH Natural Heritage Bureau does not track these species, nor do they seek locational data for them. Although the listing does not give the plants any legal protection, it does give the landowner recourse if someone digs it up without the landowner's permission.<sup>11</sup>

## 12.2 Invasive Species

**Why include "Invasive Species" in a Natural Resources Inventory?** It is important that those of us who reside in Gilmanton be informed and aware of invasive species (plants, insects and fungal species) that have the potential to destroy and displace those natural resources that are vital to our biodiversity. According to the New England

<sup>10</sup> New Hampshire Natural Heritage Bureau, Department of Resources and Economic Development, Concord, NH.

<sup>11</sup> NH Natural Heritage.

Wildflower Society, nearly 1/5<sup>th</sup> of New England's 3,000 plant species are in danger of disappearing from our region. In addition, invasive species are destroying public natural areas at an estimated rate of 4,600 acres per day. The Nature Conservancy estimates that 42% of all species on the Federal Endangered Species Lists are listed partly due to the effects of invasive species (and for 18%, invasive species are the sole reason for their listing).<sup>12</sup> According to the US Department of Agriculture website ([www.usna.usda.gov/gardens/invasives.html](http://www.usna.usda.gov/gardens/invasives.html)), over \$100 million dollars a year is spent in the United States combating invasive plants in wetlands alone. Rich, diverse plant communities can become barren, inhospitable expanses of invasive plants with little value to wildlife. Invasive plants may even deplete groundwater. The public must be educated to buy plants wisely and to control existing invasive plants. Additional information is available at Cooperative Extension offices.

**What is an Invasive Species?** An Invasive Species is a plant, insect, and/or fungal species that is not naturally native to a particular region and has the ability to thrive and spread aggressively outside its natural range. The Invasive Species thrives and spreads in a new habitat due to the fact it has no natural predators (insects, diseases and/or foraging animals) that naturally keep its growth under control as they would in their own native habitat.

**Why and Where are Invasive Species a problem?** Without any natural predators to prevent its spread, the invasive species, particularly in the case of plants, will put extreme pressure on native plants and animals. Ultimately the invasive plant will alter native habitats and reduce biodiversity by choking out native vegetation, threatening rare and endangered species and degrading wildlife habitat. With the loss of native vegetation and wildlife habitat also comes the loss of a number of our native animal, bird and insect species that depend on the native habitats to survive. Invasive species present the worst threat in wetlands, sand dunes, fire prone areas, and serpentine barrens where rare native plants are found.<sup>13</sup>

Invasive plants:

- Produce large numbers of new plants each season;
- Tolerate many soil types and weather conditions;
- Spread easily and efficiently, usually by wind, water, or animals;
- Grow rapidly, allowing them to displace slower growing plants;
- Spread rampantly when they are free of the natural checks and balances found in their native range<sup>14</sup>.

In 2000, the State of New Hampshire enacted legislation under House Bill 1258-FN which "requires the Commissioner of Agriculture, Markets, and Food to conduct research and educational activities which address the effects of invasive plant, insect and fungal

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<sup>12</sup> *Conservation Notes of the NE Wildflower Society*, Vol. 2, No. 3, 1998.

<sup>13</sup> United States National Arboretum.

<sup>14</sup> United States National Arboretum.

species upon the state".<sup>15</sup> As a result of this legislation, the New Hampshire Invasive Species Committee was formed. The Committee consists of nine members with representatives from the Department of Agriculture, Department of Environmental Services, Department of Resources and Economic Development, Department of Transportation, NH Fish and Game, the University of New Hampshire, The Nature Conservancy, the horticultural community, and the general public.

House Bill 1258-FN further "requires the commissioner to publish annually lists of invasive species that present potential or immediate danger to the environmental and economic interests of the state".<sup>16</sup> The annual lists are broken down into three categories.

**1. N.H. Prohibited List:** invasive species deemed to present an immediate danger to the health of native species, to the environment, to commercial agricultural or forest crop production or to human health. These species are immediately prohibited from sale, transport, distribution, propagation or transplantation in New Hampshire. Note that this list does not include species already prohibited since 1998 under RSA 487:16-a of the NH Department of Environmental Services.<sup>17</sup>

<i>Ailanthus altissima</i>	Tree of Heaven
<i>Alliaria petiolata</i>	Garlic mustard
<i>Berberis vulgaris</i>	European barberry
<i>Celastrus orbiculatus</i>	Oriental bittersweet
<i>Cynanchum nigrum</i>	Black swallow-wort
<i>Cynanchum rossicum</i>	Pale swallow-wort
<i>Eleagnus umbellata</i>	Autumn olive
<i>Heracleum mantegazzianum</i>	Giant hogweed
<i>Iris pseudocacorus</i>	Water-flag iris
<i>Ligustrum obtusifolium</i>	Blunt-leafed privet
<i>Lonicera bella</i>	Showy bush honeysuckle
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Lonicera morrowii</i>	Morrow's honeysuckle
<i>Lonicera tatarica</i>	Tatarian honeysuckle
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Rhamnus cathartica</i>	Common buckthorn
<i>Rhamnus frangula</i>	Glossy buckthorn
<i>Rosa multiflora</i>	Multiflora rose

Among the invasive plant species that present the most danger to our native plants and animals are purple loosestrife, Oriental bittersweet, bush honeysuckle, autumn olive and Japanese barberry, burning bush, and multiflora rose. A single, mature purple loosestrife is capable of producing as many as 2.7 million seeds in one growing season. The

<sup>15</sup> Final Version HB 1258-FN.

<sup>16</sup> Final Version HB 1258-FN.

<sup>17</sup> UNH Cooperative Extension *News & Views for New Hampshire's Green Industry*, July-September, 2004.

Oriental bittersweet will twine itself up 60 – 70 foot trees and strangling them to death. Giant hogweed is very toxic to humans, causing blistering and scarring upon contact.

**2. Restricted List:** species which present the potential for environmental or economic harm, but such potential may be reduced or eliminated by cultural or biological practices. These species exhibit invasive tendencies, but do not meet all the criteria to be listed as Prohibited. These species will be reevaluated by the ISC as more research and/or documentation becomes available.

<i>Ampelopsis brevipedunculata</i>	Porcelain-berry
<i>Centaurea maculosa</i>	Spotted Knapweed
<i>Cirsium arvens</i>	Canada Thistle
<i>Coronilla varia</i>	Crown Vetch
<i>Eleagnus angustifolia</i>	Russian Olive
<i>Euonymus fortunei</i>	Wintercreeper
<i>Glyceria maxima</i>	Sweet Reedgrass
<i>Ligustrum vulgare</i>	Common Privet
<i>Lonicera maackii</i>	Amur Honeysuckle
<i>Lysmachia nummularia</i>	Moneywort
<i>Microstegium vimineum</i>	Japanese Stilt Grass
<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Populus alba</i>	White Poplar
<i>Pueraria lobata</i>	Kudzu
<i>Robinia pseudoacacia</i>	Black Locust
<i>Ulmus pumila</i>	Siberian Elm

**3. Prohibited Species as of January 1, 2007.** Existing stocks of these species may be sold until this date.

<i>Acer platinoides</i>	Norway maple
<i>Berberis thunbergii</i>	Japanese barberry
<i>Euonymus alatus</i>	Burning bush

**4. Prohibited Insect Species List:** insect species that pose a threat to the state.

<i>Acarapis woodi</i>	Honeybee Tracheal Mite
<i>Adelges tsugae</i>	Hemlock Woolly Adelgid
<i>Aeolesthes sarta</i>	City Longhorned Beetle
<i>Anoplophora glabripennis</i>	Asian Longhorned Beetle
<i>Callidellum rufipenne</i>	Cedar Longhorned Beetle
<i>Dendrolimus sibericus</i>	Siberian Silk Moth
<i>Fiorinia externa</i>	Elongated Hemlock Scale
<i>Hylurgus lingniperda</i>	Redhaired Bark Beetle
<i>Ips typographus</i>	European Spruce Bark Beetle
<i>Lymantria dispar</i>	Asian Gypsy Moth



*Popillia japonica*  
*Pyrrhalta viburni*  
*Rhizotrogus majalis*  
*Symantria monacha*  
*Tetropium fuscum*  
*Varroa destructor*

Japanese Beetle  
 Viburnum Leaf Beetle  
 European Chafer  
 Nun Moth  
 Brown Spruce Longhorn Beetle  
 Varroa Mite

### 13.0 BENEFICIAL INSECTS

Why include Beneficial Insects in the Natural Resources Inventory? Beneficial insects are a natural way to fight insect pests and protect our environment. When we encourage beneficial insects we are increasing our biodiversity and decreasing our dependency on poisonous chemical controls. Not only are we creating a more beautiful environment, but a safer one as well.

There are two categories of insects considered beneficials ---- predators and parasites. Predators are organisms that kill and feed on their prey outright. They are generally larger than their prey and must eat lots of prey to complete their development. Parasites are usually smaller and often weaker than their prey. They lay eggs on or within a host insect. The immature larvae use the host for food over time. A parasite will use only one or a few insects for food.<sup>18</sup>

You can entice beneficials to your yard and garden by providing them with the three basic necessities: water, food and shelter. In addition, you should avoid using and/or spraying broad-spectrum insecticides. The broad-spectrum insecticides are not selective in that they will kill not only the pest but the beneficial as well. Even the organic pesticides will kill the beneficials.

The following is a list of the more important beneficial insects we should encourage:

**Table 17 Beneficial Insects**

Beneficials	Pests They Prey On
Aphid midge	60 species of aphids (on vegetables, flowers, fruit and shade trees.)
Aphid parasites	Several aphids, including green peach, melon and pea aphids.
Assassin bugs	Many insects including, Japanese beetles, leaf hoppers, flies, tomato hornworms, caterpillars.
Big-eyed bug	Eggs and small larvae of armyworms, hornworms, loopers, corn earworms, spider mites, aphids, leafhoppers, flea beetles, mealybugs and thrips. One big-eyed bug can eat 12 small caterpillars or leafhoppers per day.
Brachnoid wasps	Tomato hornworm, armyworm, cabbageworm, gypsy moth, other caterpillars, beetle larvae, flies, aphids and other insects.
Bumblebees	Extremely important wild pollinators for a variety of fruit and seed crops.
Centipedes	Predators of soil-dwelling pests and insects including slugs, worms and fly pupae. They may also feed on earthworms, but are considered beneficials.
Damsel bugs	Aphids, thrips, leafhoppers, caterpillars, plant bugs and tree hoppers.
Damselflies, Darners & Dragonflies	Mosquitoes and small flying insects.

<sup>18</sup> University of Maine Cooperative Extension

Fireflies and spiders (arachnoids)	Almost anything.
Ground beetles	Most species prey on slugs, snails, cutworms and cabbage-root maggots in soil; some pursue prey on plants or trees, such as Colorado potato beetle larvae, gypsy moth and tent caterpillars.
Honeybees	Extremely important pollinators of fruit, vegetables and agricultural crops. It is estimated that over 80 percent of pollination is done by domestic honeybees. <sup>19</sup>
Ichneumon wasps	They lay their eggs inside other host insects such as caterpillars, sawfly, beetle larvae and other pests then parasitizes and kills the host.
Lacewings	Soft-bodied insects including aphids, thrips, mealybugs, some scales, moth eggs, small caterpillars and mites.
Lady beetles; Ladybugs	Aphids, thrips, mealybugs, mites or soft scales.
Mealybug destroyer	Mealybugs, scale insects, aphids.
Millipedes	Feed on decaying plant material and are beneficial in breaking down organic matter. May occasionally feed on plant material laying on ground, like strawberries and tomatoes.
Minute pirate bugs	Will eat anything, but prefer thrips, spider mites, eggs of many insects, small caterpillars, leafhopper nymphs, corn earworms.
Praying mantis	Almost anything, including other beneficial insects.
Predatory mite	Spider mites
Predatory thrips	Eggs and larvae of spider mites, aphids, other thrips, codling moth, Oriental fruit moth, bud moth, peach twig borer, alfalfa weevil, whitefly, leafminer flies and scales.
Rove beetles	Many are predators of aphids, springtails, nematodes, fly eggs and maggots in the soil; some are parasitic on cabbage-root maggots and larvae of other flies. Many species are scavengers on decaying material.
Spider mite destroyer	Many species of spider mites, especially in unsprayed raspberry patches.
Spined soldier bug	Many species of hairless caterpillars and beetle larvae including fall armyworm, sawfly larvae, Colorado potato beetle and Mexican bean beetle larvae.
Syrphid flies (hover or flower flies)	Many species of aphids infesting vegetables, flowers and fruit trees.
Tachinid flies	Many species of caterpillars, including cutworms, armyworms, tent caterpillars, cabbage looper, gypsy moth; some attack sawflies, Japanese beetle, May beetle, squash bugs, green stink bugs and sowbugs.
Tiger beetles	Both adults and larvae prey on a wide variety of insects, but are considered mostly beneficial.
Trichogramma wasps	Eggs of over 200 species of moths, including spruce budworm, tomato hornworm, corn earworm, corn borers and codling moth.
Yellow jackets	Adults seize large numbers of caterpillars, flies, beetle grubs and other insects to feed their young.

## 14.0 WILDLIFE HABITAT

<sup>19</sup> Rodale's Successful Organic Gardening – Controlling Pests and Diseases, 1994

Gilmanton's forests, rocky ridges, farmland, and abundance of water provide rich and diverse habitat for numerous animal species. An inventory of animals for Gilmanton has never been conducted, so the extent of special habitats, rare species and common species is unknown. However, some information is available. These special habitats and unfragmented natural lands need to be conserved in order to prevent common species from becoming rare and rare species from being extirpated from New Hampshire.

#### **14.1 Unfragmented Open Space**

Large blocks of forest, wetlands and farmland that are unfragmented by development or public roads are valuable for many reasons. They:

- Provide essential forest interior habitat for species such as some songbirds that need to be distanced from human activity, pets, and the forest edge in order to survive;
- Provide habitat for mammals that have large home ranges and prefer to avoid human contact such as bobcat, otter, and moose;
- Enable owners of large parcels of forestland to conduct timber harvests that are economically viable;
- Minimize conflicts that can arise when managed forests and farms are surrounded and interspersed with development;
- Offer opportunities for remote recreation, including hunting, hiking and snowmobiling, where landowners allow.

Larger fragments are more likely to support viable populations of species and therefore act as a source of individuals that can then move to another fragment. Small fragments may be unable to support breeding populations. Persistent fragmentation may also lead to genetic changes and a loss of genetic diversity as populations are subdivided into small locally breeding populations.

Many large blocks of forestland are still intact in Gilmanton. About 70% of Gilmanton's forests are part of a contiguous area of forestland of at least 500 acres in size.<sup>20</sup> The table below lists the 14 largest areas of contiguous open space in town and some of their major attributes. A threshold of 500 acres was used, which has some basis in conservation biology for the survival of many wildlife species.<sup>21</sup> The location of the blocks is also shown in Figure 6, the Unfragmented Lands Map. The map was made by constructing a 500 ft. buffer around all roads. Water bodies and streams are also shown on the map. A one mile buffer around the Town was included in the map. Table 18 below has a column with the acreage that is in Gilmanton only, and another column that includes the acreage in the adjacent towns that is a part of the 1 mile buffer.

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<sup>20</sup> Sundquist, 1999

<sup>21</sup> Kanter, John, et als, 2001, and Patterns of Development Task Force, 1997.

**Table 18 Unfragmented Open Space Blocks in Gilmanton Over 500 Acres**

Rank in Town	Fragment Name	Acres In Town	Acres Including 1 mile Buffer	Features
1	Belknap Mountains	4967	9795	Durrell Mt., Grant Hill, Hidden Valley, Manning Lake
2	Cogswell Mtn/Nelson Brook	3567	3567	Town Forest, Headwaters of Crystal Lake
3	Sawyer Lake/Middle Rte.	2860	2860	Smithers Forest, Nighthawk Hollow Brook & Wetlands
4	Parsonage Hill/ Meetinghouse Pond	1757	1757	Varney Brook, Peaked Hill, Smith Meetinghouse, Prime farmland
5	Pancake Hill	1544	1544	Frisky Hill, Ladd's Ledge
6	Ayers Brook	1500	1500	Gilman Rd. Snowmobile trail, Wetland systems
7	Loon Pond	1345	1345	Loon Pond Easement, Meadow Pond State Forest, Academy Brook Wetlands
8	Nighthawk Hollow Brook	1231	1231	Aquifers, Wetlands, Tributaries to Upper Suncook Lake
9	Pine Hill	1207	2058	Pine Hill Town Forest, Snowmobile trails
10	Jones Mill	757	1176	Academy Brook, Loon Pond Brook
11	Kimball Brook	650	1016	Aquifer, Wetland system
12	Badger Brook	577	962	Watershed to Sargent Lake in Belmont
13	Hall's Hill	538	2096	Scenic views, Prime farmland
14	Sanborn Hill	532	1217	Rollins Pond, Prime farmland, Kelley Brook

\*acres include land and water and some farmland

Conserving these large blocks and connections between other significant habitat areas is important if residents want to retain the species that need larger and diverse home ranges and territories. It is important to note that the acres above are for unfragmented blocks in the town and for blocks including the one mile buffer. Some areas should be studied further because the extent of unfragmented lands extends significantly into an adjacent Town making that block more important. For example, the entire unfragmented block labeled Belknap Mountain is 18,709 acres if town boundaries are not considered and the block labeled Hall's Hill increases from 538 acres in Gilmanton to 4,246 acres.

Habitat block size requirements for various animals is currently a subject of much study. The following data is from a draft Fish and Game Habitat Manual Analysis dated January 26, 2004.

**Table 19 Unfragmented Block Requirements Per Species**

<b>Acres</b>	<b>Species</b>
25	Minimum size for breeding pair of whip-poor-wills
100	Minimum size for a red-shouldered hawk
100	Area required for viable population of wood thrush
500	Approximate maximum dispersal area for wood, spotted or Blanding's turtle
1200	Minimum home range for northern goshawk
1320	Maximum home range for Cooper's hawk
3900-6144	Minimum home range for lynx
9400	Area required for breeding pair of northern goshawks
23,616	Average home range of male bobcat in Maine

## **14.2 Species of Concern**

There are no official records of endangered or threatened species in Gilmanton and no inventory of animals for Gilmanton has ever been conducted. It should be noted that many species will be added to a list of species of concern if their habitat continues to be diminished. An extensive and detailed wildlife inventory should be completed for Gilmanton. The NH Natural Heritage Bureau's (NHNHB) database does not include any threatened or endangered species that have been observed in Gilmanton. However, the following bird species that are tracked by the NHNHB have been reported to the Commission: Bald Eagle, Brown Thrasher, Common Loon (nesting on Manning, Sunset and Crystal Lakes), Eastern Screech Owl, Great Blue Heron (at least two rookeries), Osprey, Red-shouldered Hawk and Whip-poor-will. Blanding's turtles have been reported in towns adjacent to Gilmanton.

Despite the lack of a formal inventory of animal species in Gilmanton, many interesting lists exist. People observing additional species should report their sighting to the Gilmanton Conservation Commission, the New Hampshire Fish and Game Department or the Audubon Society of New Hampshire. Some of the species reported to the Commission are listed in the tables below.

**Table 20 Bird Species Observed in Gilmanton**

American Black Duck	Dark-eyed Junco (slate-colored)	Olive-sided Flycatcher
American Goldfinch	Downy Woodpecker	Osprey
American Kestrel	Eastern Bluebird	Ovenbird
American Redstart	Eastern Kingbird	Pheasant
American Tree Sparrow	Eastern Phoebe	Pileated Woodpecker
American Woodcock	Eastern Wood-Pewee	Pine Grosbeak
Bald Eagle	Evening Grosbeak	Pine Siskin
Baltimore Oriole	Flycatcher	Purple Finch
Barn Swallow	Fox Sparrow	Red-breasted Nuthatch
Barred Owl	Gold-crowned Kinglet	Red-headed Woodpecker
Belted Kingfisher	Grasshopper Sparrow	Red-shouldered Hawk
Black-and-white Warbler	Gray Catbird	Red-tailed Hawk
Black-capped Chickadee	Great Blue Heron	Red-winged Blackbird
Black-throated Blue Warbler	Great Horned Owl	Robin
Black-throated Green Warbler	Great-crested Flycatcher	Rose-breasted Grosbeak
Blue Grosbeak	Hairy Woodpecker	Ruby-throated Hummingbird
Blue Jay	Hermit Thrush	Ruffed Grouse
Bobolink	Hooded Merganser	Rufous-sided Towhee
Broad-winged Hawk	House Finch	Scarlet Tanager
Brown Creeper	House Sparrow	Screech Owl
Brown Thrasher	House Wren	Sharp-shinned Hawk
Canada Geese	Indigo Bunting	Song Sparrow
Canada Warbler	Killdeer	Tree Swallow
Cardinal	Least Flycatcher	Tufted Titmouse
Cedar Waxwing	Loon	Turkey
Chestnut-sided Warbler	Magnolia Warbler	Turkey Vulture
Chipping Sparrow	Mallard Duck	Veery
Common Flicker	Mourning Dove	Vireo
Common Grackle	Nashville Warbler	Whip-poor-will
Common Nighthawk	Northern Flicker	White-breasted Nuthatch
Common Redpoll	Northern Harrier	White-throated Sparrow
Common Yellowthroat Warbler	Northern Mockingbird	Wood Thrush
Cooper's Hawk	Northern Raven	Yellow Bellied Sapsucker
Cowbird	Northern Shrike	Yellow-rumped Warbler
Crow		

**Table 21 Mammal Species Observed in Gilmanton**

Bat	Gray Squirrel	River Otter
Beaver	Long-tailed Jumping Mouse	Short-tail Weasel (Ermine)
Black Bear	Mink	Shrew
Bobcat	Mole	Skunk
Chipmunk	Moose	Snowshoe Hare
Coyote	Opossum	Vole
Eastern Cottontail Rabbit	Porcupine	White-footed Mouse
Fisher	Raccoon	Whitetailed Deer
Flying Squirrel	Red Fox	Woodchuck
Gray Fox	Red Squirrel	

**Table 22 Reptile Species Observed in Gilmanton**

Brown Snake	Gray Tree Frog
Common Snapping Turtle	Northern Spring Peeper
Eastern Garter Snake	Red Eft (Red-spotted Newt)
Eastern Milk Snake	Wood Frog
Eastern Painted Turtle	Wood Turtle
Eastern Smooth Green Snake	

### 14.3 Significant Habitats

All wildlife needs food, shelter, water and space to survive. These life requirements are defined as an animal’s habitat. Animals use a variety of strategies to find food, water and shelter in the environment and it is these strategies that determine the habitat needs for each species. Habitat is everywhere, yet some habitat is more important to wildlife than others. Habitat is more significant when it:<sup>22</sup>

- Supports a rare species;
- Represents a smaller percentage of the landscape;
- Provides an abundance of food or other resources;
- Provides a buffer for wildlife against the effects of development;
- Supports several types of habitat.

The following habitat types are considered to be significant in New Hampshire:

- Habitat of Rare Wildlife Species** – examples include bald eagle wintering areas, peregrine nesting cliffs, common loon nesting areas and Great Blue Heron rookeries. In Gilmanton, loons have been known to nest on Crystal Lake, Manning Lake and Sunset Lake. Herons have nested on a beaver pond on Middle Route, on the beaver

<sup>22</sup> Identifying and Protecting New Hampshire’s Significant Wildlife Habitat: A Guide for Towns and Conservation Groups, NH Fish and Game Department, 2001.

pond across from the school and in a wetland along the outlet stream from Lake Eileen.

- b. ***Unfragmented Lands*** – Large tracts of contiguous habitat that include a mix of forests, wetlands, riparian areas or other habitat which support wide-ranging mammals and forest interior birds. Gilmanton is fortunate to have several large unfragmented blocks of land. See Section 13.1 of this report for more details.
- c. ***Riparian Areas and Large Wetlands*** – Riparian areas along water courses, especially those areas that connect river corridors, wetlands and unfragmented lands. Large wetlands or wetland complexes that support a variety of wetland dependent wildlife. The Nighthawk Hollow Brook and Nelson Brook areas are examples of this habitat in Gilmanton. Refer to section 5.1 of this report for more information.
- d. ***Agricultural and Other Open Land*** – Large fields and shrub lands that support species dependent on this open land type. This habitat has been disappearing in Gilmanton as farmland is converted to development or reverts back to forest.
- e. ***Other Unique or Critical Habitats*** - This habitat type is divided into the following groups:
  - Habitat that is rare statewide, for example pine barrens;
  - Habitat that is rare in a particular geographic area, for example mountains in southern New Hampshire;
  - Uncommon land features which provide unique conditions for certain species, for example denning sites in rock piles;
  - Habitat critical to certain species during a particular phase of their life cycle or a particular time of the year. Examples include vernal pools, waterfowl migration stop-over sites and deer wintering areas, all of which are found in Gilmanton. Crystal Lake and associated wetlands are valuable stop-over sites for migrating waterfowl in the spring and fall. Canada and Brant geese, mergansers, pied-billed grebes, mallards, and many other species rest and feed here. Migrating geese also feed in the stubble of Gilmanton cornfields in the late fall. Seeps or seepage wetlands are generally small areas (less than ¼ acre) that occur where groundwater comes to the surface. These sites are the first to green-up in the spring and are frequented by a variety of wildlife for that reason. Dependent species include bear, deer, moose, turkey, salamanders, migrating birds and woodcock.<sup>23</sup>

The New Hampshire Fish and Game Department recently completed the statewide mapping of significant wildlife habitat using the protocol outlined in “Identifying and Protecting New Hampshire’s Significant Wildlife Habitat: A Guide for Towns and Conservation Groups”. These maps can be viewed at the Town Hall and should be used to focus attention on areas that should possibly be protected and that should, at a minimum, be studied carefully before any destruction of the habitat occurs.<sup>24</sup> The Habitat Features Map shows riparian corridors, wetlands larger than 5 acres, clusters of wetlands less than 5 acres, agricultural and other non-forested lands, uncommon habitat types and south facing slopes. A co-occurrence map shows what happens when all of the

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<sup>23</sup> *Good Forestry in the Granite State*, NH Division of Forests and Lands and SPNHF, 1997.

<sup>24</sup> NH Fish & Game Department, 3/31/04, Coarse Filter Analysis of Potentially Significant Wildlife Habitats.



habitat features are overlaid each other. The darker the color, the more habitat features that overlap and the greater the significance to wildlife. Information, that was not included in this mapping project includes bird migration stopover habitat, deer wintering areas, mast production areas and vernal pools. The New Hampshire Fish and Game Department has begun the process of refining these coarse filter analysis maps.

#### 14.4 Fisheries

Fishing is a popular hobby and Gilmanton’s fisheries are an important natural resource. It is important to keep in mind that many of our fish have been contaminated by mercury and other pollutants. Before eating any fish, consult with the most recent advisories as to what is a safe consumption level.

The following information was supplied by Jim Juneau, the NH Fish and Game Department Conservation Officer responsible for our region. All trout species noted below are annually stocked. Stocking reports for the previous year are available on Fish and Game’s website at [www.wildlife.state.nh.us](http://www.wildlife.state.nh.us). In addition, detailed maps are included in a publication by DeLorme Publishing Company, Freeport ME 04032. This publication included maps for Crystal and Manning Lakes and shows a maximum depth of 51 feet in Crystal Lake and 56 feet in Manning Lake.

**Table 23 Fisheries in Gilmanton**

<b>Lakes and Ponds</b>	<b>Species</b>
Crystal Lake	Rainbow Trout, Warm Water Species, Possibly Smelt
Kids Pond (Academy Building)	Eastern Brook Trout
Lake Eileen	Warm Water Species
Loon Pond	Warm Water Species, Possibly Smelt
Manning Lake (Guinea Pond)	Eastern Brook Trout, Warm Water Species, Smelt
Meeting House Pond	Warm Water Species
Rocky Pond	Warm Water Species
Rollins Pond	Warm Water Species
Sawyer Lake	Warm Water Species
Shellcamp Pond	Warm Water Species
Sunset Lake	Warm Water Species, Smelt
<b>Rivers and Streams</b>	<b>Species</b>
Ayers Brook	Eastern Brook Trout
Guinea Brook (Moulton Brook)	Eastern Brook Trout
Nelson Brook	Eastern Brook Trout
Nighthawk Hollow Brook	Eastern Brook Trout
Suncook River	Eastern Brook Trout, Warm Water Species

Warm water species may include small mouth bass, large mouth bass, yellow perch, pickerel, sunfish, hornpout and others.

#### **14.5 Wildlife Recommendations**

Gilmanton's wildlife, and the habitat that it requires, is an important component of the rural character of the town that is so important to its residents. Because the habitat maps highlight large, unfragmented blocks of land and wetlands, conserving key wildlife habitats will also work towards preserving rural character and water quality.

- Protect significant habitats.
- Decrease pollutants so that all wildlife, including humans have a safe food supply, clean air to breathe and clean water to drink.
- Protect riparian corridors with wetland buffer in a Wetland Ordinance.
- Keep unfragmented parcels unfragmented.
- Minimize impacts to significant habitat during development by requiring that a wildlife study be conducted.
- Conduct scientific studies of potentially significant habitats possibly with interns from college-level programs.
- Educate the public as to what a significant habitat is.

### **15.0 RECREATIONAL TRAILS**

A much utilized, but often overlooked part of the Natural Resource Inventory of Gilmanton is the extensive trail system that exists in town. Hikers, horseback riders, hunters, snowmobilers and ATV'ers all benefit from the trail system that has been developed. This system is comprised of many discontinued and non-town maintained roads, (see list), logging roads and age old trails. The Gilmanton Snowmobile Association should be thanked for their efforts in both trail maintenance and landowner permission. Through this permission and cooperation of the many resident and nonresident land owners, the trail system exists for the benefit of all to use and enjoy responsibly.

There are challenges to this system that have been appearing lately. Changes in ownership of land over which the trails pass have led to the closing of some of the trail system to many of its users. Gates have been erected and land posted in a direct challenge to Gilmanton's and New Hampshire's tradition of keeping land open to the public. These private closings of roads will no doubt be challenged in the near future.

Developers have finally taken note of Gilmanton's combination of large tracts of land and proximity to Concord and points south. The next few decades promise to bring the greatest threat to the present quality of life enjoyed in Gilmanton. There are those that eye the utilization of existing class VI roads as an easy way to reduce land development costs without giving thought to the loss of the trail system to the general public. It is much cheaper for a developer to

use and upgrade an existing road than to cut a new road through the virgin rock and soil that has remained undisturbed since the beginnings of the town. They seek to benefit from the hard labor of the founders of Gilmanton that created these roads out of necessity, and in the public interest, often with nothing more than a team of oxen and an iron pick. These old roads, laid out by the Yankee farmers that founded Gilmanton generally took the paths of least resistance and as a tribute to their unselfish labor, still exist today in much the same layout they did one hundred, two hundred or three hundred years ago.

Sadly, the trail system that exists today as a hidden gem yet often overlooked component of the quality of life of the townspeople can easily be lost to the developer's axe in just a few short years. The trails can't be replanted like a forest, or cleaned up like a polluted river. Once they are gone, they will never again exist. Their loss would greatly impact the many users that today count their existence as one of the good things about living in Gilmanton. The next generation of residents of Gilmanton may never know the benefits of this natural resource unless we act today to protect it for them. We have indeed come to a fork in the road as our decisions will affect not only ourselves, but those that will follow in our footsteps. To borrow a line from a wise New Hampshire Yankee farmer much wiser than I,

“ ...two roads diverged in the wood, and  
I took the one less traveled by,  
And that has made all the difference.”

**Table 24 Roads That Have Made a Difference**

Donovan Road	Pancake Hill Road
Durrell Mountain Road	Parsonage Hill Road
Gale Road	Pine Hill Road
Garrett Hill Road	Prescott Road
Gilman Road	Rogers Road
Grant Hill Road	Sanborn Hill Road
Howard Road	Sawtooth Road
Joe Jones Road	Thistle Road
Mary Butler Lane	Valley Shores Road
Nelson Road	

### 15.1 Trail Recommendations

Gilmanton residents enjoy being outside whether it be for snowmobiling, hiking, skiing or bird watching. Currently, there is an extensive trail system made up of Class VI roads, discontinued roads and other paths on private property. It is important that this trail system be preserved for future generations. Recommendations that might make this possible include:

- Development on Class VI roads only after a master plan for their use has been completed and only after an alternative trail system suitable for all trail uses has been developed;

- Develop a community trail system suitable for multi-use. All types of users should be involved in the planning process;
- Maintain trail connectivity during the subdivision process;
- Develop trail guides;
- Improve pedestrian trail systems on town-owned land;
- Develop a system for maintaining and constructing pedestrian trails. Ideas include a Trail Committee, possibly as a subcommittee of the Conservation Commission and Trail Work Days;
- Do not let one trail use destroy the trail for other users.

## 16.0 SCENIC RESOURCES

The diverse topography and land types in Gilmanton make it a very scenic place. Views of mountains, forests, fields, lakes, streams and wetlands, particularly in juxtaposition, are enjoyed by residents and visitors alike. Many favorite scenic landscapes are viewed from public roads. These have been identified over the years in public meetings and surveys. Frisky Hill is most often mentioned. Views of ridgelines and forested hillsides across open fields or water seem to be most highly valued.

In addition, Gilmanton participated in a Lakes Region Planning Commission project in 1998 to identify important local natural and cultural features. These “Local Resource Protection Priorities” were mapped and are in the process of being updated. The draft updated list can be found in Appendix E.

The following is an attempt to compile all of this information, but the list should not be considered inclusive and it has not been prioritized. Only scenic resources that can be observed from a public road or are easily accessible are included.

### *Landscape Views*

Belknap Range as viewed from many places; Durrell Mountain, Swett Mountain and Mount Mack are in Gilmanton.

Fields off of NH Rte. 107

Fields on Stage Rd.

Fields on Stone Rd.

Frisky Hill and view of Belknaps and the undeveloped foothills to their south

Grant Hill

Guinea Ridge

Halls Hill

Pancake Hill/Ladd’s Ledge

Peaked Hill

Pine Hill

Stockwell Hill

Sunset Hill (top of Copp Rd.)

View both north and south from White House on Guinea Ridge

***Scenic Roadways***

Currier Hill Road  
Durrell Mountain Road  
Gale Road  
Guinea Ridge  
Joe Jones Road  
Meadowbrook Road  
Meetinghouse Road  
Sawtooth Road  
Stone Road

***Scenic Farms or Former Farms***

Albee (Ham Estate)  
Bosiak Farm  
Dawson Farm  
Foss Farm  
French Farm  
Gayle Page Levesque Farm  
Geddes Farm  
Herman Page Farm  
Kardinal Farm  
Kelley Farm  
Moore Farm  
Perkins Farm  
Potter Farm  
Price Farm and Sugar House  
Sanborn Farm  
Warburton Farm

***Scenic Waterbodies***

Academy Brook  
Crystal Lake  
Kettle Hole Ponds by Crystal Lake  
Lake Eileen  
Loon Pond  
Manning Lake at boat launch  
Meetinghouse Pond  
Nelson Brook and Wetlands  
Rollins Pond from NH Rte. 129  
Suncook River  
Sunset Lake

Undeveloped frontage on Manning Lake, Crystal Lake at north end and across from park, and Meetinghouse Pond

### ***Scenic Wetlands***

Bean Road Wetlands

Cogswell Mountain Conservation Area Wetlands

Hidden Valley Wetlands

Hunkins Brook Beaver Pond at headwaters

Jones Farm Conservation Area Wetland

Kelley Meadows

Kimball Brook Wetlands

Nelson Brook at Nat's Bridge

Nighthawk Hollow Brook and Associated Wetlands

Shellcamp Pond Wetlands

Suncook Flats Wetlands

Suncook River Wetlands at NH Rte 140

Townline Wetlands near NH Rte. 129

Wetlands/Beaver Pond on Middle Route (two locations)

Wetlands/Beaver Pond on north side of NH Rte. 140 across from the school

### ***Rivers and Steams***

Ayers Brook and Associated Wetlands

Kimball Brook and Associated Wetlands

Nelson Brook and Associated Wetlands

Nighthawk Hollow and Associated Wetlands

Suncook River

### ***Town Forests – All***

A scenic resource that is often overlooked is the *night sky*. Low levels of light pollution allow a clear view of stars, planets and other celestial objects.

## **16.1 Regional Resources**

Gilmanton should look beyond its Town boundaries when planning for the future. Much of the view and rural character is based upon an unobscured view of the Belknap Mountain Range. However, much of this range is outside the borders of the Town. The Town should work with adjacent towns to protect this view and also preserve the vast passive recreational opportunities offered by this range.

In addition to the view, unfragmented blocks of land extend into the surrounding towns and it is important to protect the portion in Gilmanton and that in the abutting town. All of Gilmanton's aquifers cross town lines and all towns should assume responsibility for their protection.

## 17.0 PROTECTED LANDS

Gilmanton's conservation and recreation lands enhance the quality of life for its residents and visitors in many ways. Hiking and snowmobile-trail users enjoy the natural beauty of Gilmanton forests, fields, ridge tops and shorelines. Wildlife benefit from extensive areas of protected habitat. Water quality and quantity are safeguarded by conservation lands. Property values and the municipal budget also benefit from conservation land as open space has a negligible impact on the tax rate compared to residential development.<sup>25</sup>

For many decades, residents have donated their lands or conservation easements on that land, to the Town, the State, or non-profit conservation organizations for the benefit of future generations. The Gilmanton Conservation Commission, Gilmanton Land Trust, Society for the Protection of New Hampshire Forests, Audubon Society of New Hampshire and State of New Hampshire have all been active partners with Gilmanton landowners in voluntarily conserving these lands. Occasionally, these groups have worked together to raise monies to purchase conservation easements on especially sensitive parcels.

Conserved lands are listed in Table 25. Some of these lands are in public ownership and have guaranteed public access. Some are protected with conservation easements and are owned by private individuals and families who retain control over whether to allow public recreational access to their lands. It should be noted that some of the Town owned lands are not permanently conserved, as the voters of the Town could vote to change to the use of these lands. Some of these lands, especially the Town Forests, should be protected in perpetuity with conservation easements.

Determining the exact number of acres of conservation land in Gilmanton is difficult because some of these lands have not been surveyed. Tables associated with some maps derived their data by digitizing inaccurate tax maps. Based on the assessor's records of parcel size, the approximate total area of conservation lands in Gilmanton is 4612 acres or 12% of the town. The Conservation Lands Map shows the location of these lands. It is important to note that nearly half of this acreage is the Hidden Valley Boy Scout Camp.

There have been several changes since Figure 7, the Conservation Lands Map, was prepared. Additions include a conservation easement on an important 104 acre parcel addition to the Cogswell Mountain Conservation Area across from the Gilmanton School, conservation easements on a 15 acre parcel adjacent to the same conservation area off of Perkins Road and a 15 acre parcel of the Perkins Farm on Perkins Road. In addition, a 25 acre parcel off of Howard Road has been given to the Town as a part of the subdivision process of the adjacent land. This parcel will improve access to the Elizabeth "Betty" Smithers Town Forest.

An additional change has occurred since the Conservation Lands Map was prepared. The Ayers Brook Town Forests formerly consisted of four different parcels. In August an abutter had his/her property surveyed and it became clear that the former Ayers Brook Town Forest I of 3.5

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<sup>25</sup> Auger, Phil, *Does Open Space Pay?*, University of new Hampshire Cooperative Extension, Durham, NH 1994

acres does not exist and the Ayers Brook Town Forest II is in a different location and is approximately 21 acres instead of 8. This experience underscores the importance of the Town having accurate surveys of the land that it owns.

The above changes are included in Table 25. The columns in the table have the following meaning:

**Protection Method**

- FO (Fee Ownership) means that the conservation parcel is owned by the Town, another governmental entity or a conservation organization.
- CE/DR means that the land is protected through a conservation easement or deed restrictions that are held by the Town, another governmental entity or a conservation organization.

**Protection Agency** – This is the conservation organization or government agency that either owns or holds the conservation easement.

**Acres** – This is the approximate size. Discrepancies are frequent since some parcels have not been surveyed. The Town tax maps were used as the data source. These figures will differ from those found on the Conservation Lands map due to the digitizing process.

**Public Access** – Yes if public access is guaranteed.



**Table 25 Conservation Lands and Town Forests**

<b>Name</b>	<b>Protection Method</b>	<b>Protection Agency</b>	<b>Acres (APX)</b>	<b>Public Access</b>
Ayers Brook Town Forests	FO	Town	81	yes
Belknap Mountain State Forest	FO	State	123	yes
Cogswell Mtn. Conservation Area	CE	Town	309	yes
Elizabeth R. Betty Smithers Town Forest	FO	Town	211	yes
Etta + Leon Tilton Memorial Forest	FO	SPNHF	211	yes
Fish Pond	FO	Town	0.5	yes
Foss Family Forest	FO	SPNHF	196	yes
Frank L. Allen Forest	FO	SPNHF	125	yes
Halls Hill Swamp	DR	Town	28	no
Hattie Smith Corner	DR	Town	14	no
Hidden Valley	CE	State	2251	yes
Howard Road Conservation Land	FO	Town	18.5	yes
Hurst	CE	Town	27	no
Johnson + Wood	CE	ASNH	190	yes
Jones Farm Conservation Area	CE	ASNH	124	yes
Kimball Brook	DR	Town	9.9	no
Lamprey Hill	CE	Town	73	no
Loon Pond Road Lot	DR	Town	17	no
Meadow Pond State Forest	FO	State	69	yes
Messina	CE	Town	28	no
Nelson Brook Town Forest	FO	Town	47	yes
Nighthawk Hollow Brook Forest	FO	Town	4	yes
Page State Forest	FO	State	4	yes
Perkins Farm	CE	Town	15	yes
Pine Hill Town Forests	FO	Town	91	yes
Rocky Pond Restoration Area	CE	State	66	yes
Sanborn State Forest	FO	State	51	yes
Sawyer Lake Forests	DR	Village District	51	no
Schoolhouse Pond Town Forest	FO	Town	0.3	yes
Shellcamp Conservation Area	FO	Town	3	yes
Suncook River Land	FO	Town	1.7	yes
Thompson Town Forest	FO	Town	123	yes
Valley Shores Conservation Area	FO	Town	24	yes
Warren Conservation Area	FO	Town	25.16	yes

The largest conserved property in Gilmanton is owned by the Daniel Webster Council of the Boy Scouts of America, the Hidden Valley Boy Scout Camp, in the northern part of town. It is conserved by a conservation easement held by the State of New Hampshire.

## 17.1 Current Use

Current Use is a method of taxation established by NH RSA 79-A which states in its purpose:

“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.”

Thus, Current Use is designed to help landowners keep their open space undeveloped by assessing the land at its present use rather than its highest potential use. It is important to understand that Current Use is not a method for permanent protection of open space land. Land placed in Current Use can be removed from that program should the landowner decide to change the use of the land, but there is a penalty called the Land Use Change Tax. Detailed information about Current Use is in the *Current Use Criteria Booklet* available from the Department of Revenue Administration online at [www.state.nh.us/revenue](http://www.state.nh.us/revenue). Approximately 58.8% of land in Gilmanon is enrolled in the Current Use program. Table 26 below details how many acres are in each Current Use category in Gilmanon.

**Table 26 Current Use in Gilmanon**

Category	Acres
Farmland	2,308
Forest Land	16,942
Forest Land with Documented Stewardship	2,414
Unproductive Land	27
Wetland	715
<b>Total Acres in Current Use</b>	<b>22,406</b>

## 18.0 LAND PROTECTION RECOMMENDATIONS

Currently, approximately 12% of Gilmanon’s lands are protected from development and half of this is the Hidden Valley Boy Scout Camp. It is interesting to note that 27% of New York City is protected land. In order to keep Gilmanon a special place, the Town must endeavor to protect

more of its lands from development but still allow for growth. This will be a challenge. Following are some steps to help the Town meet this challenge.

- More information is needed to prioritize lands to be protected. Public input should be solicited regarding the locations listed under scenic resources. In addition, a co-occurrence map overlaying different natural resources should be completed. Such a map is beyond the abilities of the Conservation Commission to complete and professional assistance will be required. A Viewshed Map would also be a useful tool.
- A funding source for land protection should be established. Possibilities include a bond issue and an increase in the percentage of the Current Use Change Tax that is placed into the Conservation Fund.
- Consider permanent protection of Town owned conservation lands and Town Forests by placing conservation easements on them.
- Develop monitoring strategies for lands that are already protected by the Town.
- Encourage use of the Open Space Subdivision provisions in the Gilmanton Zoning Ordinance.
- Consider zoning that would limit development above certain elevations.

## 19.0 SUMMARY AND CONCLUSIONS

As the preceding pages have shown, Gilmanton is a special place. The wealth of its natural resources make it a delight for the people who live here and a destination for those from all over who enjoy the outdoors and the recreational opportunities it provides. As a watershed for the Winnepesaukee, Soucook, Upper and Lower Suncook Rivers, Gilmanton's importance to New Hampshire far exceeds its borders. It is tempting to want to protect it in its entirety. Change and development, however, are not only inevitable but essential if a community is to maintain its vibrancy. The challenge is to provide for growth that is designed and intelligent rather than rampant and greedy. The areas where development can take place safely need to be identified and clearly defined. To that end we must keep the purity of our lakes, ponds, and waterways in mind. The open space and scenic vistas provided by our agricultural land and the excellent soil that land represents must be treated with respect. In addition, maintaining habitat for the biodiversity that exists in Gilmanton is essential. Humankind tends to look at its fellow creatures with an eye to the good they do for us. How much wiser it seems to keep in mind the words of Moses Maimonides in his *Guide for the Perplexed*: "It should not be believed that all things exist for the sake of man. On the contrary, all the other beings too have been intended for their own sakes and not for the satisfaction of something else."

It is the hope of the Gilmanton Conservation Commission that this Natural Resource Inventory will be a valuable resource as we plan for the future of our Town.