

**NATURAL RESOURCES INVENTORY**  
**UNITY, NEW HAMPSHIRE**



*Open field in Unity Center*

Published June 2008

Developed by  
UNITY CONSERVATION COMMISSION

In partnership with  
UPPER VALLEY LAKE SUNAPEE  
REGIONAL PLANNING COMMISSION



# Natural Resources Inventory Unity, New Hampshire

## TABLE OF CONTENTS

1.	Introduction.....	1
2.	Methodology .....	2
3.	Natural Resources .....	3
3.1.	Geographic Location and Topography .....	3
3.2.	Land Cover and Land Use.....	3
3.3.	Unfragmented Land.....	4
3.4.	Watersheds and Surface Waters.....	5
3.5.	Wetlands.....	6
3.6.	Groundwater Resources.....	7
3.7.	Threats to Water Quality.....	8
3.8.	Agricultural Soils.....	8
3.9.	Wildlife Resources.....	9
3.10.	Highest Ranked Wildlife Habitat.....	10
3.11.	Cultural and Historic Resources.....	11
4.	Existing Protections for Natural Resources .....	13
4.1.	Master Plan .....	13
4.2.	Zoning.....	13
4.3.	Current Use .....	13
4.4.	Conservation Lands.....	14
5.	Summary .....	17
6.	A Plan for Future Action.....	18

Appendix A: Data Source Documentation

Appendix B: Species-Habitat Crosswalk

Map 1: Base Map

Map 2: Land Cover

Map 3: Unfragmented Land

Map 4: Water Resources

Map 5: Agricultural Soils

Map 6: Wildlife Habitat

Map 7: Conservation Land

Map 8: Development Limitations



## 1. Introduction

Unity is a rural town with a population of 1,700 covering 37.2 square miles in western New Hampshire. Unity remains rather undeveloped, especially in comparison to the surrounding towns of Charlestown and Newport, and city of Claremont. The forested hills serve as the headwaters for the Little Sugar River and the combination of lakes, streams, wetlands, open fields, and forests within Unity provide a diverse array of natural resources for human and non-human inhabitants.

The Unity Conservation Commission is enabled by RSA 36-A to “conduct researches into its local land and water areas” and to “keep an index of all open space and natural, aesthetic or ecological areas.” To accomplish these duties, the Conservation Commission completed a Natural Resources Inventory in 2008. Conservation Commission members involved in the project were Bardon A. Flanders (chair), John Bott, Ernest Bridge, Stanley J. Rastallis, and Jenny Wright. This inventory yielded much information about the Town’s natural resources that had not been previously compiled into one report or study.

This Natural Resources Inventory contains a visual and written description of the natural resources within the Town of Unity, as well as an analysis of the current and potential future protections for these resources. The information contained in this report can and should be used to:

- Educate and promote awareness about Unity’s natural resources,
- Document current conditions in order to track changes over time,
- Develop land conservation priorities for Unity,
- Provide a basis for master planning and land use planning decisions.

Unity, just as in all towns, relies on its natural resources for drinking water, agricultural production, construction materials, wood-based heat, flood control, and other necessary supplies. The natural resources of the town also promote a high quality of life through the quiet rural setting abundant with wildlife, scenic vistas, and recreational opportunities. As the population of the town is projected to rise in the next twenty-five years (from 1,650 in 2005 to 2,210 in 2030), the Conservation Commission encourages the Town of Unity to protect its natural resources while anticipating continued growth.

The status and significance of natural resources and their protections do change over time, and this inventory should not be construed as a “final product.” The inventory includes a summary of what exists at the current time and recommends actions for the future; this document should be revisited periodically to update the inventory with newly available data, protections, and priorities for natural resources conservation.

## **2. Methodology**

The Unity Conservation Commission developed this Natural Resources Inventory, with technical assistance from the Upper Valley Lake Sunapee Regional Planning Commission, in spring and summer 2008. Emphasis was placed on completing a basic inventory, consisting of readily available data. The Conservation Commission acknowledges that more work can be done in documenting more site-specific natural and cultural resources.

Information on the natural resources in Unity was derived both from statewide data sources and local knowledge. Corrections to the statewide data were made by the Conservation Commission. Information for the following natural resources and base geographic features was compiled:

- Political boundaries
- Infrastructure – roads, railroads, and utility lines
- Surface water features – rivers, streams, lakes, and ponds
- Topography
- Wildlife habitat land cover
- Soils
- National Wetlands Inventory
- Aquifers
- Public water supplies
- Wellhead protection areas
- Potential sources of water contamination
- Watershed boundaries
- Natural Heritage Bureau rare and threatened species
- Highly ranked wildlife habitat from the Wildlife Action Plan
- Floodplains
- Public/conserved land
- Local Resource Protection Priorities

More information about the natural resources data are described in Appendix A.

Digital maps were created by Upper Valley Lake Sunapee Regional Planning Commission, using ArcGIS 9.2. A description of each resource was written based on the contents of these maps and associated information.

A review of current land protection methods and regulatory controls that are designed to safeguard natural resources was completed. Local regulations and planning documents were reviewed, and various types of conserved and protected lands in Unity were documented.

The Conservation Commission determined a list of future actions that should be undertaken in order to better protect Unity's significant natural resources.

### **3. Natural Resources**

#### **3.1. Geographic Location and Topography**

The Town of Unity, NH is located in the southwestern corner of the State in Sullivan County. Unity is bordered by Claremont and Newport to the north, Goshen to the east, Acworth and Lempster to the south and Charlestown to the west. There are three village centers within the town: East Unity, West Unity, and Quaker City, which is in the southwest corner of town (Map 1).

The terrain of Unity is hilly, with streams running through the valleys between the hills. There are a few lakes and ponds in town, covering 0.2 square miles, or 128 acres; the land area of town is 37.0 square miles, or 23,806 acres.

#### **3.2. Land Cover and Land Use**

Unity is heavily forested (90% of the town land cover), composed of three major forest habitat types:

- Hemlock-hardwood-pine,
- Northern hardwood-conifer, and
- Lowland spruce-fir.

Roughly half of Unity is covered with a hemlock-hardwood-pine mixed forest, although this habitat type is intermixed with other forest types. Through the center of Unity, there is a mosaic of northern hardwood-conifer forest and lowland spruce-fir forest; the western and eastern sections of Unity are mostly covered with hemlock-hardwood-pine forest. Appalachian oak-pine forest is a small component of forest cover in Unity, covering only 499 acres, or 2.1% of the town's land area. This habitat type is found in the westernmost part of town.

Other important land cover types are grasslands covering 25 or more acres and wetlands, including peatlands, wet meadows, and shrub wetlands (Map 2).

**Table 1. Natural Land Cover Types in Unity**

<b>Habitat Type</b>	<b>Acreage</b>	<b>% of Unity</b>
Appalachian oak-pine forest	499	2.1%
Grasslands	1,132	4.8%
Hemlock-hardwood-pine forest	12,717	53.4%
Lowland spruce-fir forest	2,540	10.7%
Wet meadow/shrub wetland	410	1.7%
Northern hardwood-conifer forest	5,666	23.8%
Peatlands	117	0.5%
<b>Total</b>	<b>23,081</b>	<b>97.0%</b>

Only three percent of Unity's land area was classified as developed or as other natural land cover, in the Wildlife Action Plan's methodology. Because these land cover types were developed using satellite imagery as well as other sources, there are limitations to the accuracy of these estimates. For example, a single house on a lawn surrounded by forest would likely be classified as forest, rather than developed. Herein lies the distinction between land cover and land use – though the land may be used as residential, it remains generally under forest cover.

Rural residential development is characteristic of Unity, with exceptions of clustered development around Crescent Lake and the institutional populations of the Sullivan County Home and Prison. Unity is connected primarily by local roads, although a few state roads do run through town: the 2<sup>nd</sup> New Hampshire Turnpike, which runs from Claremont to Lempster, Unity Springs Road, from Lempster to Newport, and West Unity Road, from the 2<sup>nd</sup> New Hampshire Turnpike south to the village of West Unity, and also a short section of County Farm Rd to the Sullivan County Nursing Home. Many roads are unpaved and many are Class VI roads that are not maintained; these contribute directly to the rural character of the town.

### **3.3. Unfragmented Land**

Due to the pattern of development in Unity, there remain many large blocks of land that are not fragmented by roads (Map 3). The Nature Conservancy completed a New Hampshire Forest Block Model in 2006, whereby the size and location of large unfragmented blocks of natural land cover were determined for the entire state. The largest forest block in Unity covers more than 10,000 acres and extends north from Unity Center into Claremont and Newport. A small area of Unity west and south of Quaker City is part of a 7,500-acre-plus forest block

that covers much of northwestern Acworth and part of Charlestown. Four other forest blocks over 1,000 acres are located in Unity.

Landscape fragmentation is detrimental to many species of wildlife, in terms of loss of habitat area, loss of habitat connectivity, increased potential for incursions of invasive or damaging species, and increased potential for vehicle-wildlife collisions as well as other undesirable human-wildlife interactions. The maintenance of large forest blocks is beneficial to both wide-ranging species such as black bear and white-tailed deer, as well as habitat-specific species that live in interior forests, such as wood thrush.

### 3.4. Watersheds and Surface Waters

A watershed is the area of land over which water drains to a certain waterbody. Watersheds can be defined locally or regionally. All surface waters in Unity ultimately drain to the Atlantic Ocean via the Connecticut River. The US Geological Survey divides the Connecticut River basin into many watersheds, and even more subwatersheds. Using this system, there are several watersheds and subwatersheds within Unity, as designated in the USGS hydrologic unit system:

- The Sugar River watershed in the northern and eastern part of Town,
- The Cold River watershed in the southeastern part of Town,
- The Little Sugar River subwatershed in the center and west of Town, and
- A subwatershed of small streams that drain directly to the Connecticut River in the northwest corner of Town (Map 1).

**Table 2. Watersheds in Unity**

<b>Watershed Name</b>	<b>Total Watershed Area (square miles)</b>	<b>Watershed Area in Unity (square miles)</b>
Sugar River	276	10.55
Cold River	102	5.6
Little Sugar River	30	20.9
Small streams to Connecticut River	87	0.1

The Sugar River is used as a secondary water supply for the City of Claremont, and so the protection of the watershed is vital to the cleanliness of the drinking water. Over ten square miles of Unity, in the northern and eastern part of town, lies within the Sugar River watershed.

The Little Sugar River is very important to Unity as it drains most of the town and is also the largest river. The watershed of the Little Sugar River covers 20.9 out of Unity's 37.2 square miles. Recent changes made to the Comprehensive Shoreland Protection Act (effective July 1, 2008) will protect the shorelines of the Little Sugar River along part of its course through Unity.

Crescent Lake is the largest body of water in Unity, which lies on the southern border of town with Acworth. The lake covers 116.2 acres, with roughly 48 acres in Unity. This lake is identified as important wildlife habitat in New Hampshire (refer to the Wildlife section of this chapter), and also provides recreational and aesthetic value to the residents living on the shores of the lake.

Gilman Pond in East Unity is valued primarily for its use as a water supply. This 67-acre pond serves as the water supply for Newport. Marshall Pond, which covers 13 acres in the central part of Unity, has value for its undeveloped and protected status; 230 acres around Marshall Pond and including the pond are protected by conservation easement. Marshall Pond is also a back-up source of water for fire fighting. All three lakes are all protected by the Comprehensive Shoreland Protection Act.

### **3.5. Wetlands**

The State of New Hampshire defines wetlands by three characteristics: hydrology, soils, and vegetation. All three must be met in order to define an area as a wetland, according to the following definition, “those areas that are inundated or saturated by surface water or groundwater at a frequency and duration of sufficient to support, and do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

Since the arrival of Europeans in North America, the most common use of wetlands was conversion to other land uses. The devaluation of wetlands as a land cover type led to the loss of roughly 50% of all wetlands in the United States, and roughly 9% in New Hampshire. Today, the values of intact wetlands are more recognized, and range from flood control to fish and wildlife habitat. The New Hampshire Method for Functional Wetlands Assessment lists the following 14 “functional values” of wetlands:

- Ecological Integrity
- Wetland Wildlife Habitat
- Finfish Habitat
- Education Potential
- Visual/Aesthetic Quality
- Water Based Recreation
- Flood Control Potential
- Ground Water Use Potential
- Sediment Trapping
- Nutrient Attenuation
- Shoreline Anchoring and Dissipation of Erosive Forces
- Urban Quality of Life
- Historic Site Potential
- Noteworthiness (such as habitat for endangered species).

The total area covered by wetlands and/or hydric soils in Unity is 2,926 acres, or 12.1% of the town’s land area. Wetlands were mapped as part of The National Wetland Inventory (NWI); however, not all wetlands were mapped, due to the limitations of a nationwide inventory. Map 4 includes both NWI wetlands and hydric soils from the Sullivan County Soil Survey to counteract some of the

underrepresentation of wetlands of the NWI. Hydric soils are those soils that have developed under saturated conditions and are one indicator of wetlands; in order to fit the definition of wetland, wetland hydrology and vegetation are also needed at a site. By looking at both the NWI data and the hydric soils data, one can have a general appreciation for the extent and location of wetlands in Unity.

One noteworthy wetland in Unity is Gallop Marsh in the southeast part of town on the border with Lempster. Wood ducks nest in this marsh, and moose are a common sight in the summer. This marsh is a Wildlife Management Area and is protected and managed by the NH Fish and Game Department.

Another noteworthy wetland type is the vernal pool. This is an intermittently flooded small pond that is filled with water in the spring and early summer, but dries up completely during the rest of the year. Vernal pools provide critical breeding habitat for many amphibians, as the impermanent nature of these ponds do not allow aquatic predators, like fish, to inhabit these pools. Amphibians breeding in vernal pools in New Hampshire include marbled salamanders, wood frogs, spotted salamanders, and Jefferson or blue-spotted salamanders.

### **3.6. Groundwater Resources**

Unity has an abundance of surface waters, but somewhat limited groundwater resources. Stratified drift aquifers, sand and gravel deposits of glacial origin, cover only 694 acres, or 2.9 percent of the town's land area. The aquifers within Unity were found to have low transmissivity (less than 1000 square feet per day) or the transmissivity is unknown (Map 4).

The majority of Unity residents and businesses rely on private wells, most of which are drilled wells into fractured bedrock, rather than sand and gravel deposits. Six public water supplies are registered with the state Department of Environmental Services:

- Sullivan County Home (with three bedrock wells),
- Unity Elementary School,
- Newport Water Works, and
- Brick Farm Dairy Barn.

A public well is defined as a piped water system having its own sources of supply, serving 15 or more services or 25 or more people for 60 or more days per year. In addition to the public water supplies serving Unity, the Newport Water Department maintains Gilman Pond as the water supply for the Town of Newport, and the City of Claremont draws surface water from the Sugar River.

Wellhead protection areas have been established for the public water supplies at the Sullivan County Home and the Unity Elementary School. The Drinking Water Supply Bureau at NH DES developed the wellhead protection program in 1991 to help safeguard drinking water supplies.

### **3.7. Threats to Water Quality**

Maintaining high water quality is of utmost importance to the health of Unity residents. In addition, wildlife species and many types of water-based recreation rely on clean water. Threats to water quality come in two forms: point sources and non-point sources. Point sources are pollution sources that can be identified to a single point, such as a leaking underground storage tank; non-point sources refer to pollution that is widespread over a geographic area and cannot be pinpointed to a single emitter. An example of non-point source pollution is fertilizer runoff from lawns into a lake. Another is oil pollution in a water body due to cars with oil leaks.

Because of Unity's rural character, there are few point sources of pollution, with the exception of the potential for leaking residential heating fuel tanks. NH DES maintains a statewide database of point sources of known and potential water contamination. This list is not all-inclusive; there may be other potential sources of pollution that exist within Unity. On this list are:

- The Unity Municipal Landfill on North End Rd is a closed unlined landfill that may impact the groundwater.
- The Sullivan County Nursing Home has a large-scale waste-water treatment lagoon as well as 3 underground storage tanks.
- Doug's Auto on the 2<sup>nd</sup> NH Turnpike has been listed as an automobile salvage yard and a potential contamination source.
- The Highway Department, Unity Elementary School, and Will's Place all have large underground storage tanks for fuel, which are potential contamination sources.

Unity is also susceptible to non-point source pollution, from failing septic systems, pesticide and fertilizer runoff from lawns and agricultural fields, salt and sand runoff from roadways. Of special concern is Crescent Lake, as the many homes along the lake may have older septic systems. The Comprehensive Shoreland Protection Act includes provisions designed to minimize the amount of runoff and the use of phosphate fertilizer near lakes and rivers.

### **3.8. Agricultural Soils**

New Hampshire is not known for its agricultural lands; glaciers scoured off the land down to the bedrock 10,000 years ago and soil has been slowly rebuilding since then. Soils tend to be nutrient-poor, shallow, and rocky, and the pockets of good soils for agriculture are few and far between. In the Sullivan County Soil Survey, there are three classes of agricultural soils, so chosen by their relative value for raising crops or livestock. These classes represent the capability of the soil for agricultural production, and not the current use of the land.

Prime farmland soils, or the best soils for the production of food, feed, fiber, forage, and oilseed crops, have been designated for the purpose of carrying out the provisions of The Farmland Protection Policy Act of 1981. This Act was established to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. Less than 2% of New Hampshire soils are classified as prime farmland soils. In Unity, 7.9% of the land (1,882 acres) is considered prime farmland, making Unity a relatively good town to practice agriculture (Map 5).

Farmland of statewide importance is the second tier of agricultural soil classification. Criteria for defining and delineating farmland of statewide importance are determined by a state committee. The third tier of important agricultural soils is farmland of local importance. The County Conservation District Board determines which soil units are locally important. These two soil classifications include soils that are useful for agricultural production, but have some limitations, such as stoniness, nutrient limitations, or excessive drainage, that preclude their designation as “prime farmland.” The extent of agricultural soils in the Town of Unity is summarized in Table 3.

**Table 3. Agricultural Soils in Unity**

<b>Agricultural Soil Class</b>	<b>Acreage</b>	<b>% of Unity Land</b>
Prime (federally designated)	1,882	7.9%
Of Statewide Importance	4,104	16.9%
Of Local Importance	1,498	6.3%
<b>Total</b>	<b>3,794</b>	<b>31.1%</b>

Agricultural soils are thinly scattered across Unity, with concentrations in and around East Lempster and Quaker City. The central portion of Unity has fewer areas of agricultural soils, with the exception of Unity Center.

The total area of important agricultural soils is much larger than the area that is currently farmed. A survey of active agricultural lands was not undertaken for this inventory, but an estimate of agricultural land has been derived from the New Hampshire Land Cover Dataset (NHLCD), a classification of land cover types based on satellite imagery collected in the 1990’s. The NHLCD shows that agriculture covers just over 1,400 acres within Unity. Hay and pasture constitute 1,375 acres, and row crops cover 53 acres.

### **3.9. Wildlife Resources**

The largely forested landscape of Unity provides habitat for many species of wildlife (Map 2). New Hampshire’s four big-game species (moose, white-tailed

deer, black bear, and turkey) all rely on forested habitats, and rare or threatened species such as bats also require forests for survival. A spreadsheet listing species associated with each habitat type has been produced by NH Fish and Game for the Wildlife Action Plan and is included in this report as Appendix B. No rare, threatened, or endangered wildlife species has been documented in Unity, but the Natural Heritage Bureau has not exhaustively surveyed the state, so it is possible that rare species do occur within Unity. If town residents have information about rare species occurrences in Unity, they should contact the Natural Heritage Bureau.

Unfragmented forest blocks are important for wildlife. As Unity is relatively undeveloped and has few fragmenting features, there are many large forest blocks (Map 3). Black bear and bobcat are two species that rely on large areas of interior forest. In addition to the size of the forests, the structure and age of the forests is also important. Generally speaking, a heterogeneous forest, one with a variety of age classes of trees that are well distributed over the landscape, provides the best habitat for the most species. Timber management practices can either enhance or degrade the wildlife value of a forest stand.

Other land cover types in Unity are not as widespread, but they provide specialized habitats to many species of wildlife. The most common types of these small-sized habitats are grasslands, wetlands, and aquatic habitats.

Grasslands are intermittent features in the landscape, as they become established after a disturbance and then are eventually taken over by forests. Several species of bird have adapted to take advantage of these communities, relying on the grasses for breeding grounds as well as a source of abundant food, in the form of seeds or insects. Grassland birds found in New Hampshire include grasshopper sparrow, eastern meadowlark, and vesper sparrow. In the Northeast, large grasslands have been disappearing, and the populations of grassland birds have declined more rapidly than any other group of birds.

Wetlands provide habitat for a great number of amphibians, reptiles, birds, and invertebrates; moose are a frequent visitor to marshes and shallow ponds during the summer months. Vernal pools provide breeding habitat to many amphibians in the spring. Lakes, streams, and rivers provide habitat for fish, insects, water birds, and semi-aquatic amphibians and mammals.

### **3.10. Highest Ranked Wildlife Habitat**

The New Hampshire Fish and Game Department recently completed an analysis of habitat condition, which was published in 2006 in The Wildlife Action Plan. Habitat types were mapped and then ranked according to their condition and risk of degradation. Measuring habitat condition entailed a lengthy analysis of various factors that impact wildlife, related to the surrounding land cover, biodiversity,

human recreation, development and land use, and air and water quality. For a thorough description of this analysis, please refer to the Wildlife Action Plan.

The analysis resulted in four classes:

- Tier 1 - Highest ranked habitat in the state (top 10-15%),
- Tier 2 - Highest ranked habitat in the biological region,
- Tier 3 - Supporting landscapes important to highest ranked habitats, and
- Habitat not highly ranked.

Tier 1, 2, and 3 habitats are wildlife conservation priorities either on a statewide or regional level.

In Unity, Crescent Lake is ranked as Tier 1 wildlife habitat (Map 6). This shallow acidic lake supports a large population of warmwater fishes, especially smallmouth bass. The lake also has excellent water quality. The lakefront is quite heavily developed, but beyond the roads ringing the lakes, there is unbroken hemlock-hardwood-pine forest which helps to protect the quality of the lake. Roughly 140 acres of this forest is classified as Tier 3, or supporting habitat.

Fields surrounding the Sullivan County Home, fields near Quaker City, and fields in East Lempster comprise Tier 2-ranked grassland, 664 acres total. These are some of the most important grassland areas in the region for wildlife. As mentioned in the previous section, grasslands provide important nesting habitat to several bird species and provide a large amount of food for both plant-eaters and insect-eaters. These grassland areas in Unity are likely hay fields or croplands, and the way that these lands are farmed or managed greatly impacts whether birds can successfully nest in these areas. The NH Fish and Game Department recognizes a need for more research on grasslands, their utility for wildlife, and conservation strategies.

Two peatlands, one 5 acres in size, the other 24 acres, were ranked as Tier 2. Peatlands are wetlands with low nutrient levels and acidic conditions, which results in slow decomposition and the accumulation of peat. Several plant species are typical of peatlands, including *Sphagnum* moss, black spruce, tamarack, sheep laurel, and leather-leaf. There are also 11 acres of marshes that are classified as Tier 2 in Unity. Marshes are dominated by grasses or shrubs, and are often home to beavers, muskrats, and waterfowl. Large wetlands or wetland complexes are very important for wildlife; generally speaking, the larger the wetland, the more wildlife it can support.

### **3.11. Cultural and Historic Resources**

Unity was incorporated as a town in 1764, and has enjoyed a long and varied history. Farming, sawmills, gristmills, mining, and summer spa-based tourism have served as important economic activities at various times throughout the history of the Town; this has left many different types of historic buildings and ruins. In 1998, the Town of Unity held a community meeting to develop a list of

Local Resource Protection Priorities, or important natural and cultural sites, features, and buildings (Map 7).

**Table 4. Local Resource Protection Priorities in Unity**

- PERRY MOUNTAIN
- QUAKER MEETING HOUSE
- QUAKER CITY SCHOOLHOUSE
- BUTCHERKNIFE CORNERSTONE
- SLACKS FALLS
- HISTORIC HOUSE – UNITY ROAD
- TOMMY DAVIS HOUSE
- BREED FARM
- SCHOOL IN WEST UNITY
- METHODIST CHURCH
- UNITY TOWN POUND
- MILL DAM
- CENTER SCHOOLHOUSE #2
- UNITY CENTER TAVERN
- FUSSCAS
- WRIGHT HOUSE
- GILLMAN POND
- MILL PROPERTY
- GRAVE SITE
- EAST UNITY SCHOOLHOUSE #1
- WALKER HOUSE
- HATHAWAY HOUSE
- GRIST MILL (BETTY HALL'S LAND)
- BRICK HOUSES - FOUR CORNERS
- NIBOIL HOUSE
- BUTTERWORTH HOUSE
- UNITOGA SPRINGS
- OLD COUNTY SCHOOLHOUSE #6

## **4. Existing Protections for Natural Resources**

### **4.1. Master Plan**

The Unity Master Plan describes the current status and future goals for the Town; it is periodically updated to reflect changes in development and community attitudes. The most recent master plan was adopted in 1996, and includes a future land use plan, which is a “comprehensive policy statement of desired land use which can be used as a guide for future growth and development of the Town.” The Master Plan provides the legal basis for zoning and other land use regulations for the Town.

Community support for protection of the Town’s natural resources was evident in the results of a 1992 community survey used to inform the Master Plan. A majority of Unity property owners supported wildlife habitat, shorelines, prime agricultural land, wetlands, scenic views, floodplains, historic buildings and landmarks, and steep slopes.

These community attitudes were used to develop the following land use goals:

- Maintain the Town’s rural and village character and scenic beauty.
- Encourage continued use of the Town’s best farmlands.
- Recognize the developmental limits on wetlands, steep slopes, and floodplains.
- Protect the quantity and quality of the Town’s water resources.
- Protect historic sites, buildings, and settings.

### **4.2. Zoning**

Unity protects steep slopes from being developed through a steep slopes zoning ordinance (Map 8). This prevents excessive erosion, which protects soil resources, water resources, and wildlife habitat.

At the March 2008 Town Meeting, Unity residents voted to join the National Flood Insurance Program. A floodplain zoning ordinance will be developed in order to protect water resources and to guard against flood losses.

### **4.3. Current Use**

Current use assessment is a program designed to encourage preservation of open space by taxing undeveloped land at its “current use” rather than its “highest and best use.” RSA 79A authorizes this program, through which parcels of field, farm, forest, wetland, natural preserves, and recreation land receive reduced assessments.

The most recent report on land in current use was compiled for 2006 by the Department of Revenue. 16,623.25 acres, or 70% of the Town, were under current use at that time. This percentage of land in current use is similar to that of the surrounding towns: Acworth (75%), Claremont (66%), Charlestown (61%), Newport (70%), Goshen (78%), and Lempster (70%).

A penalty exists for withdrawing land from current use for another purpose, but it is possible to withdraw land from current use and develop it. Therefore, current use is not considered a long-term conservation method.

#### 4.4. Conservation Lands

Conservation lands are undeveloped lands that are protected from future development by governmental ownership or conservation easement. Depending on the type of protection, these lands may or may not be protected in perpetuity. Certain parcels of public land are designated as state or national forests, state parks, wildlife refuges or management areas, or receive other special designation whereby the land will be protected from development. Other public lands as well as private land may be protected by a conservation easement, a deed restriction where the development rights have been removed. Publicly owned land without a conservation easement or other deed restriction retains its development rights, which provides no permanent protection; these lands are sometimes referred to as unofficial conservation lands.

Roughly nine percent, or 2,099 acres, of the Town of Unity is conservation land (Map 7). Sullivan County, the Town of Newport, the Town of Unity, and NH Department of Fish and Game are the landholders or managers of 2,207 acres of public land. Only 569 acres of public land are permanently protected; the remaining 1,458 acres are unofficially protected. Two private landowners have conservation easements on their land, totaling 72 acres.

**Table 4. Publicly Owned and Conserved Land in Unity**

<b>Parcel Name</b>	<b>Acreage in Unity</b>	<b>Owner/Agency</b>	<b>Protection Type</b>
Sullivan County Farm (multiple parcels)	1,092.7	Sullivan County	“Unofficial” – no permanent protection
Marshall Pond Easement	230.0	Sullivan Co./ Unity/SPNHF	Conservation Easement
Judkins Easement	258.0	Sullivan Co./ Unity/SPNHF	Conservation easement
Newport Water Dept. Land	365.3	Town of Newport	Water supply–no permanent protection
Unity Town Forest	27.7	Town of Unity	Permanent conservation land
Unity Town Land	34.0	Town of Unity/NH DRED	Conservation Easement
Gallop Marsh WMA	19.3	NH Fish and Game	Permanent conservation land
Bridge Easement	18	Town of Unity	Conservation easement
Page Easement	54	Upper Valley Land Trust	Conservation easement

Sullivan County owns five geographically-distinct tracts of land in the western and central part of the Town of Unity, totaling 1,570.7 acres. The majority of this county-owned land is considered unofficial conservation land, as the owner agency intends to keep the land undeveloped, but it is not permanently protected. However, 488 acres in two land tracts have been further protected by conservation easement, which protects land from development permanently. These conserved lands are known as the Marshall Pond Easement and the Judkins Easement.

The Marshall Pond Easement, in the northern part of Unity, is comprised of Marshall Pond (16.1 acres in size) and 217.9 acres surrounding the waterbody. The conservation easement is held by the Town of Unity and the Society for the Protection of New Hampshire Forests. This parcel was protected in 1992. This parcel may be accessed by Mica Mine Rd., and is open for public recreation.

The Judkins Easement is a 258-acre parcel in the western part of town has recently been placed under conservation easement (2008). This parcel may be accessed by Judkins Rd and Bible Hill Rd, and is open for public recreation. Both of these parcels have easements that protect the conversion of natural land cover to other uses and management plans to keep the land in a natural state.

The City of Newport is the second largest public landowner in Unity; the Newport Water Department Land comprises 365.3 acres, including the area of Gilman Pond. This land is owned and controlled by the Town of Newport for its water supply, but is not permanently protected with a conservation easement or deed restriction.

The Town of Unity owns two parcels of undeveloped land, the Old Stage Rd. Lot in the southwestern corner near Quaker City, and the Town Forest Lot on Old Bible Hill Rd. in the northwestern corner. The Old Bible Hill Rd. Lot is considered permanent conservation land because it is owned and managed as town forest. The 34 acres of the Old Stage Rd. Lot were put under conservation easement in 1998, through the Land and Water Conservation Fund. The easement is held by the Town and the NH Department of Resources and Economic Development.

New Hampshire Department of Fish and Game (NHFG) manages the 19.3 acre Gallop Marsh Wildlife Management Area, which straddles the Unity-Lempster line along Unity Springs Rd. A Wildlife Management Area is designated as an area for wildlife resource conservation, hunting and fishing.

Two private landowners have placed conservation easements on their properties. Ernest and Beverly Bridge own conserved land along the eastern side of Coon Brook, north of Huntoon Brick Farm Rd; the Town holds the easement on 18.0 acres. Lawrence and Evelyn Page own land along Black North Rd. on the Unity-

Acworth town line, southwest of Quaker City; 63 acres, 54 of which are in Unity, is under a conservation easement held by the Upper Valley Land Trust.

## 5. Summary

The Town of Unity is situated in a forested, rural landscape that provides wildlife habitat and protects drinking water. The large areas of land that are unfragmented by roads and other human infrastructure are an invaluable resource, one that is at great risk of degradation. Large forested blocks provide not only habitat for many species of wildlife, but also provide the economic base for the timber harvesting and management industry. These areas also provide protection for both the quantity and quality of the drinking water supply. Unity's forested lands provides water not only for its residents with groundwater wells, but also for the residents of Newport and Claremont who utilize surface waters of Gilman Pond and the Sugar River.

Unity also has a significant resource of agricultural soils, some of which are actively farmed, and these fields and pastures also provide habitat to grassland birds whose numbers are declining in the Northeast. This working landscape provides for both the environment and the economy, and is an integral part of the rural character of the community.

While all natural resources are important, the farm fields and large areas of forest are two natural resources that should be highlighted for their significant size in Unity and importance for protecting multiple facets of environmental quality and also quality of life for Town residents. Protection of forests and farms will go far to protect other natural resources.

## **6. A Plan for Future Action**

This Natural Resources Inventory aims to educate the residents and town officials of Unity on the value of natural resources within Town and the current status of protection of these resources. From this Inventory, priorities can be developed and decisions can be made regarding appropriate land uses and land protection efforts. The Conservation Commission intends to utilize this information for its natural resources protection work and also intends to present the maps and report to Town boards and the public.

The completion of this report reflects one step in the process of developing a conservation plan for the Town of Unity. The public will be invited to comment on the current report and provide their input regarding future work to be done. Additional information that may be important to the Town includes active agricultural land, parcels in current use, scenic areas and views, and recreational resources. An important aspect of this public input will be a determination of the “societal value” of these natural resources and an assessment of the most important and most threatened areas; these will be useful to the Conservation Commission in developing conservation priorities for the Town.

The report will also be given to the Planning Board for their comments and input. The Conservation Commission encourages the Planning Board to incorporate the information in the Natural Resources Inventory into the upcoming Master Plan update.



## Appendix A: Data Source Documentation

Name	Scale	Date	Source
Political boundaries	1:24,000	1993	NH GRANIT
Roads	1:24,000	2008	NH DOT
Railroads	1:24,000	1993	NH GRANIT
Transmission lines	1:24,000	1993	NH GRANIT
Surface water	1:24,000	2006	NH GRANIT/USGS
Topography	1:24,000	1998	USGS/UVLSRPC
Wildlife habitat	Varies	2006	NH Fish and Game
Soils (Sullivan County)	1:24,000	2006	USDA NRCS
National Wetlands Inventory	1:24,000	2001	US Fish and Wildlife Service
Aquifers	1:24,000	2000	USGS
Public water supplies	Varies	2006	NH DES
Wellhead protection areas	Varies	2006	NH DES
Drinking water source protection areas	Varies	2006	NH DES
Watershed boundaries	1:24,000	2006	NH GRANIT/USGS
100-year floodplain	1:24,000	2005	FEMA
Public/conserved land	1:24,000	2008	NH GRANIT
Local Resource Protection Priorities	Unknown	1998	UVLSRPC/NH DES
Known and potential sources of water pollution	Varies	2006	NH DES

The proportional data scale listed here represents a ratio between distance on the map and distance on the ground. A 1:24,000 scale means that one unit of distance on the map represents 24,000 units on the ground; this is a common scale because 1 inch on the map is equal to 2,000 feet on the ground. It is important to recognize the inherent limitations to accuracy by working at this scale; the smallest area that can be delineated at this scale is 3-5 acres.

With the exception of data from NH Department of Environmental Services (NH DES), all data are distributed by NH GRANIT, the state's GIS clearinghouse. Data are periodically updated, as new data sources become available and conditions on the ground change. Many base map features, including political boundaries, railroads, transmission lines, roads, and surface water, have their origin in US Geological Survey 7.5-minute topographic quadrangle maps.

### NH GRANIT Data Disclaimer:

Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center (CSRC), under contract to the Office of Energy and Planning (OEP), and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. OEP, CSRC, and the cooperating agencies make no claim as to the validity or reliability or to any implied uses of these data.



# Appendix B

New Hampshire's species of greatest need of conservation and associated habitats. Habitats are marked (X) for a particular species if they are important for completing life history cycles. Habitats only occasionally used by species were generally excluded. This table is intended to be a cross reference for users of the plan when selecting species and associated habitat profiles of interest.

## Watershed Groupings

1. Connecticut River Mainstem Watersheds
2. Southern Upland Watersheds
3. Northern Upland Watersheds
4. Montane Watersheds
5. Coastal Transitional Watersheds
6. Non-Tidal Coastal Watersheds
7. Tidal Coastal Watersheds

## Matrix Forest Types

8. Appalachian Oak-Pine Forest
9. High-Elevation Spruce-Fir Forest
10. Lowland Spruce-Fir Forest
11. Northern Hardwood-Conifer Forest
12. Hemlock-Hardwood-Pine Forest

## Medium and Small-Scale Habitats

13. Alpine
14. Anthropogenic Grassland
15. Anthropogenic Shrublands
16. Caves and Mines
17. Cliffs
18. Coastal Islands
19. Dunes
20. Floodplain Forests
21. Marsh and Shrub Wetlands
22. Peatlands
23. Pine Barrens
24. Rocky Ridges and Talus Slopes
25. Salt Marshes
26. Vernal Pools

SPECIES	WATERSHED GROUPINGS							MATRIX FOREST TYPES							MEDIUM AND SMALL-SCALE HABITATS												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
<b>Invertebrates</b>																											
Barrens itame																											
Barrens xylotype																											
Broad-lined catopyrtha																											
Brook floater		X			X	X	X																				
Cobblestone tiger beetle																											
Cora moth	X																										
Dwarf wedgemussel	X	X	X																								
Eastern pond mussel	X	X				X	X																				
Frosted elfin butterfly																											
Karner blue butterfly																											
Persius duskywing																											
Phyllira tiger moth																											
Pine barrens zandlognatha moth																											
Pine pinion moth																											
Puritan tiger beetle																											
Ringed boghaunter																											
Sleepy duskywing																											
White Mountain arctic																											
White Mountain fritillary																											
<b>Fish</b>																											
Alewife																											
American brook lamprey																											
American eel																											
American shad																											
Atlantic salmon																											
Atlantic sturgeon																											
Banded sunfish																											
Blueback herring																											
Bridle shiner																											
Burbot																											
Eastern brook trout																											
Finescale dace																											
Lake trout																											
Lake whitefish																											

SPECIES	WATERSHED GROUPINGS							MATRIX FOREST TYPES							MEDIUM AND SMALL-SCALE HABITATS											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Northern redbelly dace																										
Rainbow smelt	X	X		X	X	X	X																			
Redfin pickerel			X			X	X																			
Round whitefish			X			X	X																			
Sea lamprey						X	X																			
Shortnose sturgeon						X	X																			
Slimy sculpin	X	X	X	X	X	X	X																			
Sunapee trout						X	X																			
Swamp darter						X	X																			
Tessellated darter	X	X	X		X	X	X																			
<b>Amphibians</b>																										
Blue-spotted salamander								X		X	X								X							X
Fowler's toad								X		X	X								X							
Jefferson salamander								X		X	X								X							X
Marbled salamander								X		X	X								X							X
Mink frog			X	X					X										X	X						
Northern leopard frog	X		X	X	X		X												X	X						
<b>Reptiles</b>																										
Black racer								X			X								X							X
Blanding's turtle							X				X								X							X
Eastern box turtle								X			X								X							
Eastern hognose snake								X			X								X							X
Ribbon snake								X			X								X							X
Spotted turtle							X				X								X							X
Smooth green snake								X			X								X							X
Timber rattlesnake								X			X								X							X
Wood turtle	X	X	X	X	X	X	X			X	X								X							
<b>Birds</b>																										
American bittern												X							X							
American black duck												X							X							X
American pipit									X																	
American woodcock												X							X							
Arctic tern																										
Bald eagle (breeding/wintering)																										
Bay-breasted warbler	X	X	X		X	X	X		X		X															

SPECIES	WATERSHED GROUPINGS							MATRIX FOREST TYPES							MEDIUM AND SMALL-SCALE HABITATS											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Bicknells thrush									X																	
Black guillemot								X																		
Canada warbler								X			X									X						
Cerulean warbler								X			X									X						
Common loon							X																			
Common nighthawk								X															X			
Common tern								X		X	X									X						X
Cooper's hawk								X																		
Common moorhen																				X						
Eastern meadowlark												X														
Eastern towhee								X						X								X				
Golden eagle																	X									
Golden-winged warbler															X											
Grasshopper sparrow												X														
Great blue heron													X							X						X
Horned lark													X													
Least bittern																				X						
Least tern																		X								
Nelson's sharp-tailed sparrow																										X
Non-breeding birds							X	X			X		X						X		X					X
Northern goshawk								X		X	X		X													
Northern harrier													X							X						X
Osprey							X	X					X							X						
Palm warbler																										
Peregrine falcon																										
Pied-billed grebe																				X						
Piping plover																			X							
Purple finch										X	X															
Purple martin																										
Purple sandpiper																										
Red shouldered hawk																				X						
Roseate tern																										
Ruffed grouse																				X						
Rusty blackbird								X			X															
Salt marsh sharp-tailed sparrow										X										X						X

SPECIES	WATERSHED GROUPINGS							MATRIX FOREST TYPES							MEDIUM AND SMALL-SCALE HABITATS											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Seaside sparrow																										
Sedge wren																					X					X
Semipalmated sandpiper																										X
Spruce grouse									X	X											X					
Three-toed woodpecker									X	X																
Turkey*											X	X														
Upland sandpiper									X		X	X		X												
Veery																				X						
Vesper sparrow									X			X		X												
Whippoorwill									X			X		X									X			
Willet																										X
Wood thrush									X		X	X								X						
<b>Mammals</b>																										
American marten									X	X	X	X														
Black bear*									X	X	X	X			X									X		X
Bobcat									X		X	X			X									X		X
Canada lynx										X	X	X			X											
Eastern pipistrelle									X		X	X				X										
Eastern red bat									X		X	X				X					X					
Eastern smallfooted bat											X	X				X										
Hairy bat										X	X	X														
Indiana bat											X	X				X										
Moose*									X	X	X	X			X						X					
New England cottontail									X			X			X						X		X			
Northern bog lemming																										
Northern myotis (long-eared bat)									X	X	X	X				X						X				
Silver-haired bat									X		X	X									X					
White-tailed deer*									X	X	X	X			X						X		X			X
Wolf										X	X	X			X						X		X			X

\* Species that are included in the NH Big Game Management Plan; Not ranked as species of highest conservation concern in Comprehensive Wildlife Strategy