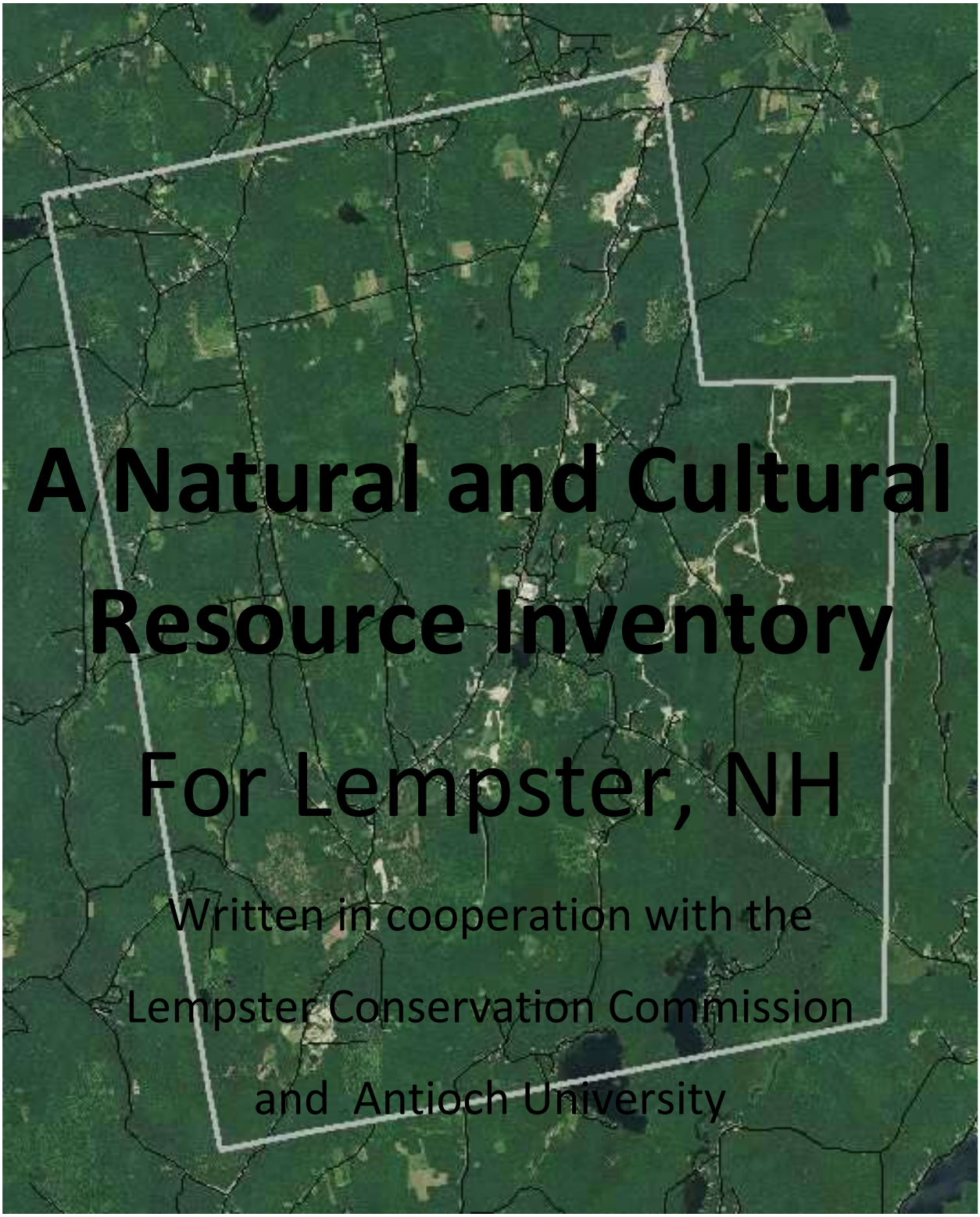

A Natural and Cultural Resource Inventory

For Lempster, NH

Written in cooperation with the

Lempster Conservation Commission

and Antioch University

Lempster, NH Natural and Cultural Resource Inventory

Table of Contents

Cultural Resource Inventory:

1) Historic Resources
    a. Brief History of Lempster
    b. Historic Sites via Research and Public Input
    c. Historic Dams

2) Cultural resources
    a. Recreation Resources
    b. Conserved and Public Lands
    c. Town Owned Forests
    d. Scenic Vistas and Viewshed Analysis
    e. Lempster Wind Farm

Recommendations:

List of Tables:

List of Figures:

Appendices:

Maps Included in the Appendix created by Martin Bean

* These maps were designed to be printed and displayed at a 36” x 34” format.

Appendices: continued

Maps:

Maps included in the Appendix produced by the New Hampshire Fish and Game Department

1) Bathymetric Map of Long Pond

2) Bathymetric Map of Sand Pond

3) Bathymetric Map of Dodge Pond

Introduction

Summary

In an effort to find a worthy and useful Master's Project for my Master's Degree in Environmental Studies at Antioch University, I approached the Lempster Conservation Commission (LCC) to discuss their goals and needs. They told me that they wanted a Natural Resource Inventory (NRI) and that the Town Master Plan recommended having one written. The goal of an inventory like this is to create a tool for town planners and residents to help with land use decisions. I discussed the project with my advisors at Antioch who agreed that this project would fulfill my requirements for a Masters in Environmental Studies.

Over the next few months, I met with the LCC monthly to discuss their goals, priorities, and values. During this process, we decided to also incorporate a Cultural Inventory to account for the town many historic and cultural resources. Together, the LCC and I gathered all the maps and documents that pertained to this inventory so we did not duplicate and work that was already done as well as to fill in gaps of information. Some of this existing information included the Towns Master Plan, maps created by UNH Cooperative Extension, NH Fish and Game, Society for the Protection of New Hampshire Forest, and various town histories. We also gathered a great deal of information from local citizens at the Lempster Old Home Day in the summer of 2010. We asked the citizens for any natural, cultural or historic resources that they knew about such as cellar holes, wildlife sightings and old mills/mines/dams.

With all of this information in front of me, I created a rough draft of a table of contents to show what was going to be in the inventory. To create the inventory I used many written references which are listed in the bibliography. I also relied heavily on Arcview GIS and data layers from the GRANIT website to create maps and analysis.

The goal of this project is to create an inventory that can be used as a tool for a wide range of issues. It will make recommendations for conservation focus areas, actions that can be adopted by the town such as a citizen science program, as well as baseline documentation of the cultural, historic and natural resources currently present in Lempster. From this document, changes in the town's resources can be identified, measured and recorded.

What is a Natural and Cultural Resource Inventory?

Broadly defined, a Natural and Cultural Resource Inventory lists and describes the natural and cultural resources within an area. It is a compilation and description of the existing natural resources as well as historic and cultural locations in a specifically defined area. In this case, the area is Lempster, NH and its links to surrounding towns. A comprehensive NRI

provides a basis for land use planning and allows natural and cultural resource information to be included in local planning and zoning. This NRI will not be a one-time effort but merely a starting point and baseline for observing changes over time.

The maps included in this inventory are created to fulfill the following criteria: 1) visually represents a value or goal expressed by the Conservation Commission or Master Plan, 2) do no duplicate existing maps, 3) will be useful and available to decision makers in land use planning issues, and 4) can be used by landowners to make better land management decisions.

How can a Natural and Cultural Resource Inventory be used?

Before the completion of a NRI, most towns do not have a clear picture of which resources their town possesses, where these resources are located and the significance of these resources. A major accomplishment of an NRI is to provide visual images, associated data tables, descriptions, and a better understanding and appreciation of the communities' resources. Some of the ways an NRI can be used include, but are not limited to, the following:

- Document current conditions so changes over time can be assessed.
- Develop a Conservation Plan.
- Educate local officials and the public about cultural and natural resources.
- Initiate and support land protection efforts.
- Provide a basis for land use planning.
- Update the Natural and Cultural Resource section of the towns Master Plan.
- Evaluate the effects of proposed land use and zoning changes.
- Screen development proposals.
-

Notes from the Master Plan

As stated in the Lempster, NH Master Plan, "Lempster's natural environment is one of the town's major assets: it's ponds, agricultural lands, hilltops, and forested areas are the backdrop and foundation for all human activities. Our physical, emotional and cultural well-being are inseparably linked to the health of natural systems…." One of the recommendations within the Master Plan is to, "Develop a Natural Resource Inventory (NRI) to identify, analyze, and make recommendations for wildlife habitat and travel corridor protection."In the Master Plan, several Natural Resource Goals were identified. This NRI will aim to fulfill a subset of these goals and better help define and clarify others. Some of this subset of goals are outlined below.

1) Preserve and protect Lempster forests to ensure that they continue to provide environmental, aesthetic, and economic benefits.

2) Conserve our agricultural lands for their positive impact on the economic base resulting from their scenic qualities and food production value.
3) Identify and conserve important open space and scenic lands for the economic and scenic values.
4) Protect and preserve sufficient and viable habitats to ensure the continuation of healthy wildlife and rare plant species.
5) Maintain or improve the water quality in all of the town's surface water features. Ensure that the water bodies continue to support environmental, recreational, aesthetic and other values.
6) Protect and preserve wetlands to ensure continued habitat preservation, flood control, and purification of surface waters.
7) Manage development of the 100 year flood plain so it can perform its function of passing and storing floodwaters.
8) Protect groundwater resources to ensure that an adequate supply of clean drinking water is available for residents, businesses and visitors.
9) Gather information and resources for, and implement, best management practices to protect surface waters and groundwater from non-point pollution.
10) Ensure that earth resource extraction methods will not result in significant degradation to the aesthetic, environmental, or economic values of surrounding areas.
11) Ensure the reclamation of land areas that are disturbed by the extraction of earth minerals.

Working Group Members and Acknowledgements

This NRI was created as a tool for the Lempster Conservation Commission and other town planners in their quest for identifying and preserving the town's natural resources. The project was made possible by a collaboration of several organizations. The first and foremost group is the Lempster Conservation Commission (LCC). The current members of the Conservation Commission include Tami Gueser (Chair), Sue Lichty, Emily Fairweather, and Jim Beard. One member of the Conservation Commission passed away this year, Yorrick Hurd. Yorrick always had an encouraging word and a heartfelt appreciation for this project. Beyond the LCC, other organizations help with the project. The Society for the Protection of New Hampshire Forests and their staff member Brian Hotz was a tremendous help in creating the Conservation Land Map. The guidance from the instructors at Antioch University including Peter Palmiotto and Chris Kane was most helpful. Finally, the author of this project, Martin H. Bean who's Master's degree in Environmental Studies will be fulfilled with the completion of this project.

Natural Resource Inventory

1) Water Resources

Lakes and Ponds

Lakes and ponds serve both humans and the natural world in a wide variety of ways. They provide drinking water and many recreational opportunities for the public. Some of these recreational activities include boating, fishing, swimming, scenic value, as well as cross country skiing and snowmobiling during the winter months. Many species require lakes and ponds while many more utilize lakes and ponds for their lifecycles and daily requirements. According to the Lempster Master Plan, more than 60 percent of respondents of a survey strongly agree that preserving lakes, ponds, and streams is important. During a Community Workshop held in 2004, participant identified a goal of preserving and raising awareness of water resources. There are four named lakes and ponds within or partially within the Lempster town boundary. These lakes and their corresponding size in acres are outlined in the table below.

TABLE 1. Named Lakes and Ponds in Lempster, NH.

Named Lakes and Ponds	Acres
Long Pond	120
Sand Pond	155
Dodge Pond	20
Hurd Pond	14
Totals	**309**

Source: Data obtained from Hydrology GIS data layer found on the GRANIT website.

There are other unnamed ponds scattered around Lempster. The larger, unnamed ponds are located near the following roads: 1. Between Nichols Road and Fifield Drive, 2. Corner of Mountain Road and Bean Mountain Road, 3. Corner of Route 10 and Silver Spring Road, 4. Route 10 across from Dow Road, 5. On Hurd Road across from Mill Road, 6. Duck Pond on Duck Pond Trail, 7. Near Tower 3 at the Lempster Wind Farm, and 8. At the end of Tucker Road. These unnamed ponds can be seen in the map located in the Appendix and labeled as “Conserved Lands and Undeveloped Shorelands”. They are associated with several stretches of undeveloped shoreland.

Long Pond or Lempster Long Pond covers approximately 120 acres. The following game species are found in Long Pond: brook trout, largemouth bass, smallmouth bass, and brown bullhead (hornpout). New Hampshire Fish and Game Department (NHFG) used to breed lake trout with brook trout from the hatchery and called them splake. It was hard to get the

breeding timing right, so they ended the program. Lempster Long Pond was the primary lake for splake. It is rumored that there was some influential NHFG associate who lived on the pond and pushed for the lake to be stocked with splake. The last recorded splake was caught five or 10 years ago at Long Pond. If there are any splake left, the population is dwindling since they cannot reproduce. The forests around Long Pond include: spruce/fir, mixed hardwoods, beech/oak, paper birch/aspen, open wetlands, as well as developed shoreland. The developed shoreland is concentrated on the southern and eastern shore while the northern and western shore is not developed. The southwestern shore is protected as conserved land. It is part of the Ashuelot River Headwaters Forest Easement. There are several islands in the pond and the water is well known to be very clean and clear. For a visual representation of Long Pond, please refer to the following maps in the Appendix: Conservation and Undeveloped Shoreland Map and the Bathymetric Map of Long Pond.

Sand Pond was originally called Echo Lake and is mainly a spring fed lake. In the 1850, the lake had a large population of white suckers yet in later years, black bass were introduced and the sucker population was drastically reduced. According to the book titled, The History of Sand Pond, around the middle of the century, the lake was drained, all the fish poisoned, and restocked with lake and brown trout. It now has the following game fish species: brook trout, brown trout, smallmouth bass, largemouth bass, yellow perch, and hornpout. It is heavily stocked to replenish the trout that would eventually be out-competed for resources by the bass. Sand Pond is surrounded by the following forest cover types: spruce/fir, mixed hardwoods, beech/oak, mixed forest, paper birch/aspen, as well as developed shoreland. The northeast shore is protected as conserved land. It is part of the Ashuelot River Headwaters Forest Easement. For a visual representation of Sand Pond, please refer to the following maps in the Appendix: Conservation and Undeveloped Shoreland Map and the Bathymetric Map of Sand Pond.

Dodge Pond is close to town and easy access from Route 10. It has the following game species: largemouth bass, pumpkin seeds, and yellow perch. Dodge Pond is surrounded by the following forest cover types: spruce/fir, hemlock, sand dunes, open wetlands roads and developed shoreland. For a visual representation of Sand Pond, please refer to the following maps in the Appendix: Conservation and Undeveloped Shoreland Map and the Bathymetric Map of Dodge Pond.

Hurd Pond is a remote access pond that has neither a public boat launch nor roadside access. The New Hampshire Fish and Game Department does not offer a list of game species as it does for the larger ponds in Lempster. With the difficulty of access and lack of information on its game species, it has remained a relatively little used gem of Lempster's water resources. According to the NH Land Cover Assessment from 2001, Hurd Pond has the following land cover

types surrounding it: hemlock, white/red pine, hay pasture, mixed forest and open wetlands. For a visual representation of Sand Pond, please refer to the following maps in the Appendix: Conservation and Undeveloped Shoreland Map. NHFG did not create a bathymetric map for Hurd Pond

Undeveloped Shorelands

Compared to surrounding towns like Washington, Lempster has relatively few lakes and ponds. However, of these lakes and ponds, there is a large amount of undeveloped shoreland. Below is a table of the undeveloped shoreland within Lempster town boundaries.

Table 2. Named Lakes and Pond in Lempster, NH and their associated undeveloped shorelands.

Named Lakes and Ponds	Undeveloped Shoreland
Long Pond	3095 meters
Sand Pond	1009 meters
Dodge Pond	718 meters
Hurd Pond	1078 meters
Unnamed Lakes and Ponds	5424 meters
Totals	**11324 meters**

Source: This data was created by visually inspecting an orthophotograph taken in 2008 and obtained from the GRANIT website.

A high conservation priority should be given to all of these undeveloped yet still unprotected shores. These undeveloped shores offer habitat for wildlife, protection from runoff and non-point source pollution, as well as enhanced scenic quality. Some of these areas are already under the protection of conservation easements such as those around Long, Sand and Hurd Ponds. Due to the more strict and restrictive Comprehensive Shoreland Protection Act (RSA 483-B), it would be difficult to develop these areas, yet not impossible. Those that are not protected should be of high priority for conservation efforts. To identify those areas with and without protection, please refer to the Conservation and Undeveloped Shoreland map in the appendix if this document.

Rivers and Streams

Although rivers, streams and brooks make up only .2 percent of all the freshwater on Earth, they do play a very vital and important role in the lives of countless organisms. They transport water from higher to lower locations and with it nutrients, organisms, gasses, and sediments move downstream (Manning, 1997). The movement of the water, over millions of

years, erodes the surrounding substrate and shapes the landscape into what it looks like today. Beyond the role of the water itself, the surrounding landscape also plays an important role in the lives of organisms. This riparian area, as it is better known, is an important habitat for many species as well as an important habitat corridor to others.

There are approximately 111 miles of streams and rivers within the town boundary of Lempster, NH. The majority of these are unnamed, undeveloped and in relatively inaccessible areas. Those that are in close proximity to developed areas or easily accessible areas have been modified by human activity. These activities include re-routing the stream bed, damming or blocking the path of the water. Below is a breakdown of the number of stream segments and the length of those segments within each watershed.

Table 3. Number and length of stream segments in Lempster, NH for each watershed.

Watershed Name	Number of Stream Segments	Total Length of Stream Segments (m)
Sugar River	139	45,559
Cold River	220	84,733
Upper Ashuelot River	114	48,810
Totals	473	179,102

Source: Data derived from the Hydrology GIS data layers obtained from the GRANIT website.

Below is a table which shows the 5 orders of streams and the number of stream segments within each order. It is broken down by the three watersheds with totals for orders as well as watersheds.

Table 4. Number of stream segments in Lempster, NH for each stream order and each watershed.

Watershed	Order 1	Order 2	Order 3	Order 4	Order 5	Totals
Cold River	102	56	44	18	0	220
Ashuelot River	51	20	27	8	8	114
Sugar River	56	53	28	2	0	139
Totals	209	129	99	28	8	473

Source: Data derived from the Hydrology GIS data layer obtained from the GRANIT website.

Stream orders are a method of classifying the relative location of a stream within a larger river system or watershed. The method assigns each headwater stream or perennial stream as an Order 1 stream. When two of these Order 1 stream join, it is considered an Order

2 stream. When two Order 2 streams converge, the downstream segment is classified as an Order 3 stream and so on (Manning, 1997).

Watersheds

The United States is sub-divided into successively smaller hydrologic units which are classified into a series of levels. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) which consists of a two to eight digit code based on the level of the classification. The smallest classification level consists of local watershed and drainage basins (USGS, 1987). There are three watersheds that are partially located within the town boundary of Lempster. These three watersheds are the Sugar River, Cold River and the Upper Ashuelot River. Below is a table that shows the different watersheds, HUC-12 names as well as the areas and percentage of area covered by the watersheds. The % land area is based on the size of the individual watershed compared to the total size of all watersheds within the Lempster town boundary. All three watersheds eventually empty into the Connecticut River at different locations. Watershed and water resource maps have already been created for Lempster, NH and its Conservation Commission so they were not created again in this inventory.

Table 5. Watershed delineation and summary of relative size for Lempster, NH.

Watershed Name	HU-12 Name	Acres	% Land Area
Cold River	Headwaters-Dodge Brook	9855	47.05%
Cold River	Vilas Pool	12	0.06%
Upper Ashuelot River	Ashuelot Pond	4933	23.55%
Upper Ashuelot River	Marlow Tributaries	51	0.24%
Sugar River	South Branch	6097	29.11%

Source: Data derived from GIS data layers obtained from the GRANIT website.

Wetlands

According to the United States Environmental Protection Agency, wetlands serve three broad functions. These functions include water storage, water filtration, and biological productivity. The ability for a wetland to absorb water basically is acting like a sponge. It absorbs the water, stores it and releases it slowly. This action slows the momentum of water, especially storm water, and therefore reduces the risk of flooding and erosion. It also allows downstream water supplies a more constant flow and recharge.

The filtration action of a wetland occurs after the water is slowed by the wetland and the suspended particles have a chance to drop out and settle to the bottom. Some of the suspended particles that drop to the bottom are absorbed by plant roots, organisms and within

the soil. Pollutants are also "filtered" out by the wetlands and often times the water leaving the wetland is cleaner than the water that flows into the wetland.

The last function of a wetland is high biological productivity. Wetlands rank nearly as high as tropical rainforests and coral reefs as the most biologically productive natural ecosystems in the world. The abundant vegetation and shallow water provides diverse habitat for fish, wildlife and aquatic organisms.

Lempster, NH has four major wetland types found in Lempster, according to the National Wetlands Inventory (Table 6).

Table 6. The four major wetland types found in Lempster, NH.

Wetland Type	Description	# of Locations	Area (acres)
PUB	Palustrine Unconsolidated Bottom	53	108
PSS	Palustrine Scrub Shrub	98	332
PFO	Palustrine Forested	106	449
PEM	Palustrine Emergent	50	150
Totals		307	1039

Source: Data was derived from the National Wetlands Inventory GIS data layer on the GRANIT website.

The National Wetlands Inventory gives the following descriptions for the four main wetland types found in Lempster (PUB, PSS, PFO, and PEM). The information can be found on the website: http://137.227.242.85/Data/interpreters/wetlands.aspx

Palustrine (P)

The Palustrine wetland system includes all non-tidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 ppt. Wetlands lacking such vegetation are alos included is they exhibit the following characteristics: 1. Are less than 8 hectares (20 acres); 2. Do not have active wave-formed or bedrock shoreline features; 3. Have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin; 4. Have salinity due to ocean-derived salts less than 0.5 ppt.

Unconsolidated Bottom (UB)

The Unconsolidated Bottom includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and vegetative cover less than 30%.

Scrub-Shrub (SS)

The Scrub-Shrub wetland includes areas dominated by woody vegetation less than 6m (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are stunted or small due to environmental conditions.

Forested (FO)

Forested wetlands are characterized by woody vegetation that is 6 meters all or taller.

Emergent (EM)

Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

Vernal pools

Vernal pools are small bodies of water that occur temporarily or seasonally in forest depressions. They form when spring runoff or rain fills in small depressions that are usually lined with naturally occurring impermeable material such as clay or bedrock. They are shallow and usually dry during the summer months. During their time, however, they do play an important role in the life cycles of amphibians. Since they form in depressions that are not connected to running water such as streams, there are no natural aquatic predators like fish. Therefore, amphibians can lay their eggs in these pools and keep their young safe from aquatic predators. This leaves them vulnerable only to land predators.

Vernal pools are small and therefore difficult or impossible to map with satellite imagery. To accurately map vernal pools, there must be a ground based survey which is both time and money consuming. For the sake of this NRI, it was decided not to inventory the vernal pools in Lempster at this time. It is, however, recommended that the town owned forests and property have a vernal pool survey conducted in the spring. Perhaps a citizen science program could be organized to methodically inventory all of the vernal pools located within town owned forests.

Dams and Mills

Many of the recorded dams and mills within Lempster are found in Figure 20 of Dorothy Hathaway's Masters of Art Thesis at Dartmouth College in 1985. These sites were compiled by Dick Diehl and Bud McCullough (Hathaway, 1985) and are now shown on the Cultural and Historical map created for this inventory and located in the Appendix. The locations are approximate and based on both Hathaway's map as well as the Hydrology GIS data layer found

in GRANIT. The sites were approximately located with the map and then overlayed more precisely over the rivers and stream layer. Other dams and mills sites were added by public input during the 2010 Lempster Old Home Day. A total of 17 sites were located, however, the specific names were not included in the inventory. For more information on the names of the mill and dam sites, please contact the Lempster Historic Society.

2) Soils

Each year, large amounts of forest, farmland, wetlands and rangelands are converted from their natural states to other uses. The World Wildlife Fund (WWF) estimates that since 1960, 1/3 of the Worlds arable land has been lost through erosion and other forms of degradation (WWF). This works about to approximately 10 million hectares per year (WWF). These unique natural resources provide food, fiber, wood, water and habitat necessary for the health of our ecosystems, economy and our safety. If the conversion of this land continues at this rate, we are jeopardizing our ability to produce enough food, fiber and wood internally and will be forced to import these basic staples. In particular, by converting wetlands to other uses, it will not only be detrimental to the flora and fauna that require these areas but also to the safety of our people by harming the flood control and pollution filtration of wetlands.

Important Forest Soils

The type and quality of the soils is one of the most important factors in forest management decisions. The types of soils present will determine which tree species will yield the greatest volume, the duration of grow time and the economic viability of the forest for the landowner. Since forests and the trees that grow in them have been such an integral part of Lempster history and economic base, the soils that affect those forests should be seriously considered. The following factors affect the quality of the soil and its productivity; topsoil's depth, soil texture, subsoil consistence class, limiting layers, fertility, and drainage. Various levels of each of these factors will determine which tree species will grow best and most vigorously on each soil.

For this inventory, only the three most productive forest soils types, the species best suited to the soil and the area covered by each class will be inventoried. A map was also produced for this inventory, named Important Forest and Agricultural Soils and located in the Appedix of this document. The map shows where the important forest soils are located and is based over an orthophotograph. This map can be used by landowners to locate their property, determine which soils type is present and then make more informed forest management decisions.

Table 7. The three most important and productive forest classes, the associated optimal species, locations and total area covered.

Forest Soils Class	Optimal Species	Locations	Total Acres
Class 1A	Northern Hardwoods	269	6967
Class 1B	Beech/Hardwoods	262	7996
Class 1C	Pine/Spruce/Hemlock	60	924
Totals		591	15887

Source: Data for this table was created from the Soils GIS layer acquired from the GRANIT website.

Wetland and Hydric Soils

According to the Natural Resource Conservation Service, Hydric soils are defined as soils that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil horizon. There are many criteria that soil must meet to make the Hydric Soil List yet this list is only an interpretive rating. For confidence in the status of a soils as Hydric or not, it must be done with an on-site investigation. Therefore this table of hydric soils is a guide and representation, not a hard truth. The Hydric Rating for soils indicates what percentage of the soils in that group are Hydric all of the time, partially, none of the time and unknown. More information on the wetlands of Lempster can be found in the water resource chapter of this inventory.

Table 8. Hydric soils ratings, location and total areas in acres.

Hydric Soils Rating	Locations	Area (Acres)
All Hydric Soils	43	842
Partial Hydric Soils	416	10068
Not Hydric Soils	372	9798
Unknown Hydric Status	72	3705

Source: Data for this table was created from the Soils GIS layer acquired from the GRANIT website.

Important Agricultural Soils

The soil structure is as important, if not more so, with agricultural soils as it is with forest soils. The original settlers to Lempster had this figured out long before the soil survey maps were produced. In Dorothy Hathaway's thesis (Hathaway 1985) there is a copy of a map that was originally created by a man named Walling at the turn of the last century. In Walling's map, the house sites are recorded and mapped. These settlement patterns occurred between

1400 and 1600 feet in elevation. There are several explanations for this pattern. The first is that these areas had warmer, open hills with lighter upland soils which were easier to till. Also, this area had more sparse trees cover so it was quicker for a farmer to clear the trees to create farmland. Beyond these reasons the alternative areas were either the sides of mountains which were too steep and ledgey or they were low areas which were swampy and thickly overgrown.

The designation of important agricultural soils was accomplished at both the state and federal levels. The USDA created the Land Use Policy in March of 1983 which specified the parameters of Prime Agricultural Soil designation. According to this policy, prime farmland must have the best combination of physical and chemical properties that promote the production of food, feed, forage, fiber, and oilseed crops. It must also be available for cropland, pastureland, rangeland, forest land, and other land uses not including development. These soils must have the proper soils quality, growing season, moisture supply, acidity, and few or no rocks. They must not be excessively erodible or saturated with water for long durations.

Farmland of Statewide importance is land that, in addition to prime farmlands, is of statewide importance for the production of food, feed fiber, forage, and oilseed crops. These criteria are determined by state agencies and are therefore specific to each state. In New Hampshire, farmland of statewide importance must have slopes less than 15%, not stony, not poorly, somewhat poorly or very poorly drained, have less than 30% shallow soils and rock outcrops and slopes not to exceed 8%, and are not excessively drained soils in glacial drifts.

Farmlands of local importance were determined on a county by county basis. In Sullivan County, soils are given the status of local importance if they are poorly drained, have artificial drainage systems and are being farmed as well as being specific soils map unites identified from the NRCS county soil survey legend, as determined by the Conservation District Board.

More information on the specific requirements of agricultural soils classification can be found in the USDA document Land Use Policy of 198 3 (number 9500-003). The website is as follows; http://www.ocio.usda.gov/directives/doc/DR9500-003.pdf.

Table 9. The three classes of agricultural soils, the number of locations and the total acres.

Agricultural Soils Class	Locations	Area (Acres)
Prime Agricultural Soils	53	778
Soils of Statewide Importance	45	857
Soils of Local Importance	150	3654
Totals	248	5289

Source: Data for this table was created from the Soils GIS layer acquired from the GRANIT website.

Within the Appendix of this document there is a map created for the Important Forest Soils and Important Agricultural Soils. Within that map, the active agricultural areas are outlined as well as the important forests and agricultural soils. This can be used by landowners to better manage their properties for both crops and trees. The map is located in the appendix of this inventory.

3) Wildlife Habitat

A major goal of the Town of Lempster Master Plan is to identify, protect and preserve sufficient and viable habitats to ensure the continuation of healthy wildlife and rare plant species. Lempster has a rich and long history of living with and utilizing its wildlife to benefit the residents. In the past, this relationship was one of exploiting a resource and is now becoming one of sustainable use and preservation. In the town archives dated March 24, 1789, shows 35 entries for the bounty of a wolf head and the payments were mostly 3 shillings and eleven pence (Hathaway 1985). In 2004, a Community Goals Workshop identified protecting wildlife resources as a goal and more than 80% of the respondents of a survey indicate that protecting wildlife habitat is important.

In 2010, New Hampshire Fish and Game Department (NHFG), working in collaboration with other conservation organizations, created the state's first Wildlife Action Plan (WAP).Through the Wildlife Grants Program, this project was mandated and funded by the federal government. It is intended to provide various organizations and decision makers throughout the state with important tools for protecting, preserving and restoring critical habitats, travel corridors and populations within the state. This NRI has analyzed some of the data and created usable tables, maps and information so the town of Lempster can use it for any land use planning decisions.

Unfragmented Lands

As part of the New Hampshire Wildlife Action Plan 2010, (WAP), the New Hampshire Fish and Game Department created a GIS data layer to identify contiguous areas of undeveloped land cover or habitat blocks within the state. This "Unfragmented Habitat Blocks" layer represents a preliminary data set completed for incorporation into the WAP. Unfragmented forest blocks are the largest scale at which conditions were assessed. This assessment will identify the largest intact portions of the landscape which will theoretically contain diverse assemblages of habitats, natural communities, wildlife, and plant populations. Unfragmented forest blocks were ranked high by the Lempster Conservation Commission in their assessment of values. The Lempster Master Plan recommended identifying and cataloguing parcels of unfragmented land in Lempster.

Unfragmented Habitat Blocks Ranked by Size

Table 10. Unfragmented Habitat Blocks ranked from largest (highest value) to smallest (lowest value) in Lempster, NH.

Rank	Acres
1	3096
2	2417
3	1626
4	1195
5	1167
6	924
7	809
8	733
9	731
10	668
11	612
12	547
13	362
14	318
15	230
16	106
17	38
18	36
19	30
20	15
21	15
22	9

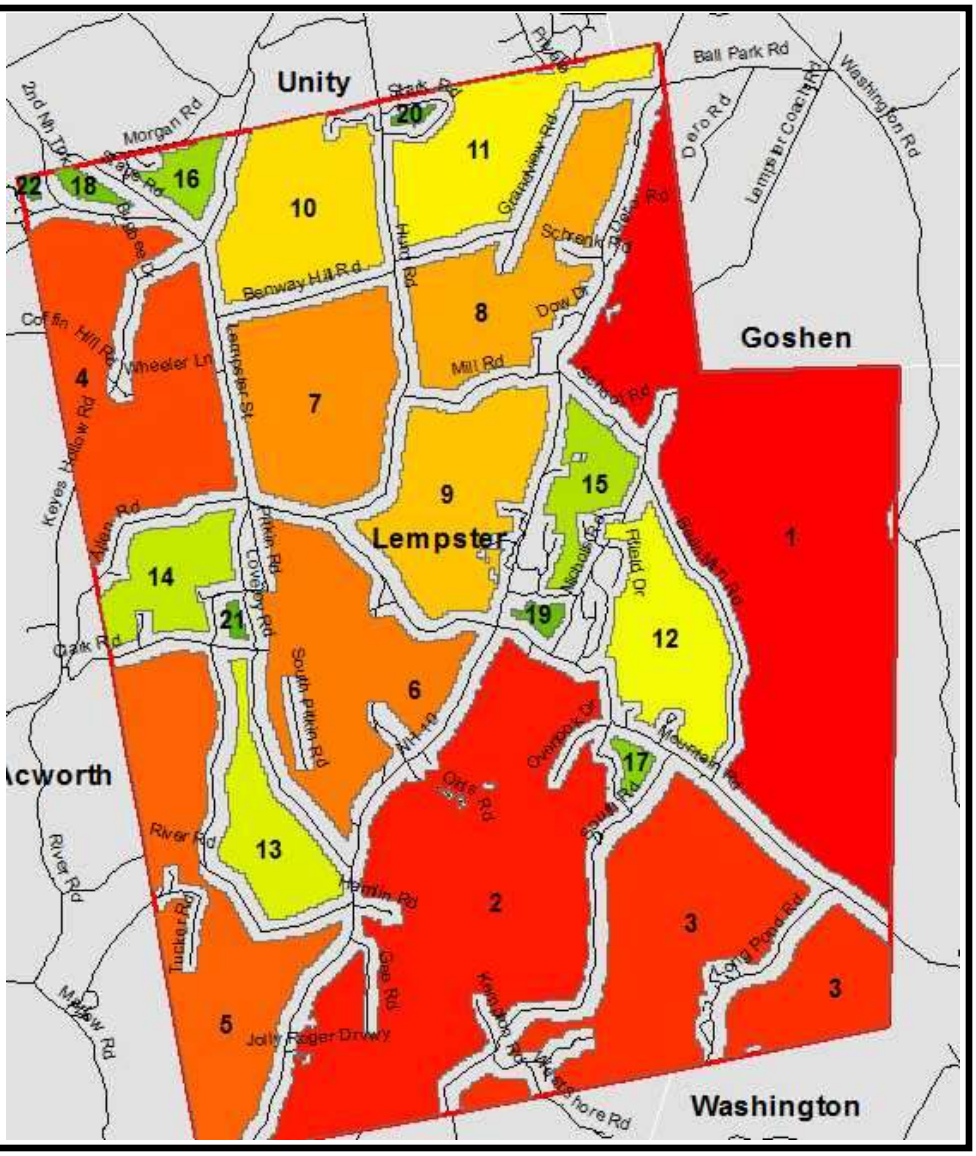

Figure 1. Highest Ranked unfragmented Habitat Blocks in Lempster, NH. Source: This data was analyzed from the Unfragmented Habitat Blocks GIS data layer in the GRANIT website. It was part of the NH Wildlife Action Plan 2010.

Highest Ranked Habitat

The NHFG created a series of maps which ranks wildlife habitat by ecological condition. The condition of wildlife habitats was analyzed by ranking the biological, landscape, and human

impact factors that are most affecting each habitat type. The biological factors that were considered include rare plant and animal species as well as overall biodiversity. The landscape factors used were the size of the habitat and how close in proximity it is to other patches of habitat. The human impact factors include road density, dams, recreational use, and pollution.

These are just a few of the factors used to rank the wildlife habitat throughout the state. The purpose of these maps and related GIS data layers is to assist communities to identify the highest ranked habitats within their towns. Town officials can then use this data to help prioritize their conservation efforts. Below is a breakdown of the three tiers of the Highest Wildlife Habitat Ranking within the Lempster town boundary. Note that animals within these habitats do not move according to town boundaries so any consideration of these rankings and conservation efforts should consider the surrounding towns as well.

Table 11. The Highest Ranked Wildlife Habitat, area, and percent conserved in Lempster, NH. This data was derived from the Highest Wildlife Habitat Ranking GIS data layer in the GRANIT website. It was part of the NH Wildlife Action Plan 2010.

Ranked Wildlife Habitat	Total Acres	Conserved	% Conserved
Highest Ranked Habitat in NH (pink)	2856	391.7	14.20%
Highest Ranked Habitat in Biological Regions (green)	678	75.5	11.10%
Supporting Landscapes (orange)	3371	519.4	15.40%
Totals	6905	986.6	14.3%

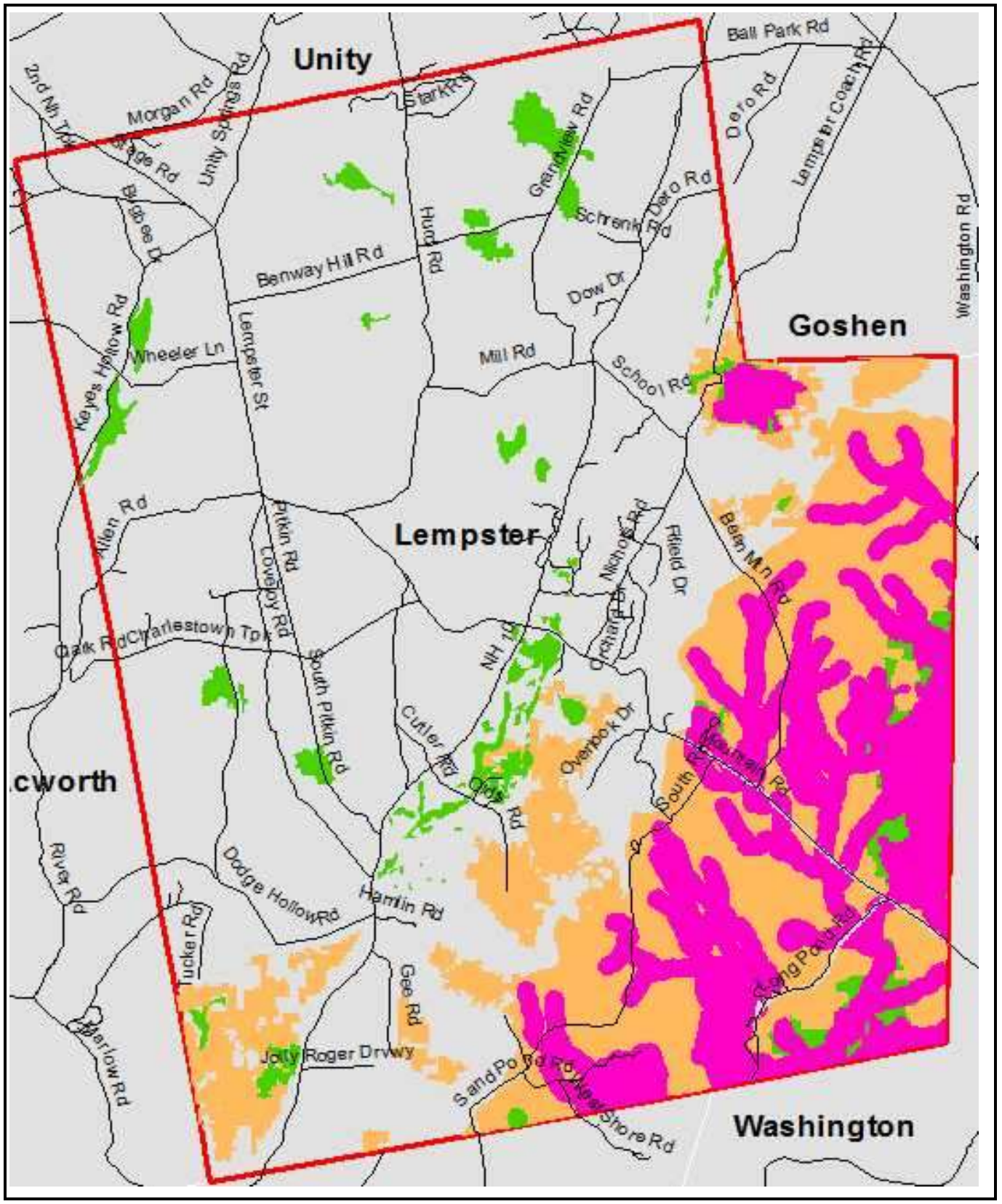

Figure 2. Highest Ranked Habitat in Lempster, NH

In Figure 2, the pink areas are of the highest ranked habitat in NH, the green is the highest ranked habitat in the biological region and the yellow is the supporting habitat. Although there are several areas of green scattered throughout the town, the majority of the ranking occur in the eastern part of the town. The area of highest ranking generally occurs east and south of Bean Mountain Road and South Road.

Natural Heritage Data

The New Hampshire Natural Heritage Bureau helps keep track of exemplary natural communities, natural community systems, rare plants and rare animals. Natural communities are defined by the bureau as collections of species that tend to occur together given certain landscape conditions such as a hemlock/white pine forest. Natural community systems are also known as ecological system. These systems are particular collections of natural communities that recur in the landscape and are linked by common underlying forces such as a salt marsh system. An exemplary natural community is one that is unusual in size, quality, or type. Most examples of rare communities are considered to be exemplary. So are large and undisturbed examples of common communities. According to the publication, "Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns" written by the NH Natural Heritage Bureau, the following are located within Lempster.

Natural Communities - Palustrine
** Emergent marsh - shrub swamp system -- -- 1 reported in town and 18 reported in state in last 20 years.
Vertebrates - Mammals
** Northern Long-eared Bat (*Myotis septentrionalis*) – (Special Concern) 1 reported in town and 9 reported in state in last 20 years
Vertebrates - Birds
** Common Loon (*Gavia immer*) – (Threatened) 1 reported in town and 270 reported in state in last 20 years
Invertebrates - Dragonflies & Damselflies
** Little Bluet (*Enallagma minusculum*) -- -- 1 reported in town and 3 reported in state in last 20 year

Figure 3. Locations of Natural Heritage Data in Lempster, NH.

When a community or species that meets the criteria is located, they are mapped digitally and referred to as representations of the occurrence. Then, there is a buffer added to account for locational uncertainty. This makes the final polygon of the location anywhere from a 12.5 meter radius to a 1.5 mile radius. The actual representation is not released for species identified as being at particular risk in their exact location becomes public knowledge. For these sensitive species, a larger 400 acre area is used to show their location.

Land Use Analysis

The New Hampshire Land Cover Assessment 2001 is the most recent and most detailed classification of New Hampshire's land cover and land use. The basis for the classification is from satellite images acquired from the Landsat Thematic Mapper. It categorizes land cover and land use into 23 targeted classes with as much detail as possible. This is an assessment, not a definitive breakdown. It was created as collaboration between NHFG, NH Department of Resource and Economic Development / Division of Forest and Lands, and the US Forest Service.

Table 12. New Hampshire Land Cover Assessment for Lempster, NH.

Lempster Land Cover 2001	Acres
Residential/ Commercial	96
Transportation	446
Row Crops	5
Hay/Pasture	701
Orchards	0
Beech/Oak	2346
Paper Birch/Aspen	452
Other Hardwoods	2222
White/Red Pine	2129
Spruce/Fir	3988
Hemlock	829
Pitch Pine	0
Mixed Forest	5604
Alpine	0
Open Water	355
Forested Wetlands	139
Open Wetlands	338
Tidal Wetlands	0
Disturbed Land	64
Bedrock	0
Sand Dunes	0
Other Cleared	847
Tundra	0
Total	**20561**

Source: Data derived from GIS data layer in GRANIT named New Hampshire Land Cover Assessment.

Wildlife in Lempster via Public Input

During the Lempster old Home Day in 2010, the Conservation Commission displayed a map of the town and asked the public to place a pin at the location that they have seen any notable wildlife sightings. The original list had to be edited slightly since some wildlife sightings were of common species such as red squirrels while others were of unknown species such as Bigfoot. Below is a list of the wildlife sightings that were added to the Historic and Cultural Map that accompanies this inventory. The sighting is the species and the pin number is the number of the pin that the resident placed in the map at Old Home Day.

Table 13. Public Input Wildlife Sightings compiled during Old Home Day 2010 in Lempster, NH.

Wildlife Sighting	Pin Number
Black Bear	83
Mountain Lion	1
Moose	64
Wood Frog	73
Red Fox	13
Black Bear	72
Mountain Lion	22
Moose	96
Mountain Lion	4
Moose and Bear	31

Cultural Resource Inventory

1) Historic Resources

Early Lempster History

Lempster was settled in the late 18th century by settlers who moved here expecting to sustain themselves with subsistence farming. There were several early "false starts" of settlement, however, the active settlement began around 1770 (Hathaway 1985). After that initial wave of settlement, there was swift growth into an enterprising community of multi-purpose farms and small business' by 1830 (Hathaway 1985).

Lempster, like many towns in this region, was settled under the terms of proprietary grants. This grant system came from the Governors needs to settle the area, develop a productive economy, and satiate migrants desire to own land. The Governor grants a township of approximately 6 square miles to a group of people known as proprietors who agree to settle the area. On Jan 16, 1735, Massachusetts made the first original grant of Lempster to create a buffer between the Connecticut River Valley settlements and Indian settlements within the interior of the state (Hathaway 1985). These "defense townships" were intended to establish Massachusetts claim to Southern New Hampshire. Although some settlers lived in the Connecticut River Valley, none chose to live in the inland buffer area. The proprietors sent a

committee to survey the township and they reported that the areas was "impractical for settlement" with no open fields and difficult transportation (Hathaway, 1985).

In 1740, Britain's King established the Massachusetts / New Hampshire boundary, located in its current location. This allowed New Hampshire's government to begin making proprietary grants within the state. The first New Hampshire based grant for Lempster was in 1753 by NH Governor Benning Wentworth and originally called the town Dupplin (Hunt, 1970). The name was changed to Lempster in 1761.

In 1772, there were 8 families settled in Lempster and held their first town meeting in 1774 (Hathaway, 1985). The number of people in town was directly proportional to the number of acres cleared for farming with each person requiring approximately 2 acres of farmland. In 1770, there were 200 acres of farmland for 128 people and in 1810 there were 950 people and 2378 acres of farmland (Hathaway, 1985). According to Walling's map from 1860, the settlement patterns indicate that the heaviest settlements were between the 1400 and 1600 foot elevations. This is perhaps due to these areas having warmer open hills with upland soils that are more easily tilled and sparse trees that allow farmers to clear land faster. The non-settled areas were either steep ledgey mountains or low areas with cold, thickly overgrown swamps.

The Second New Hampshire Turnpike was incorporated in 1799 and brought a new era of growth to Lempster. Soon, the town center became Lempster Street, as the 2nd NH Turnpike was linked to the Cornish-Windsor Covered Bridge (Hathaway, 1985). For a more thorough and complete history, please refer to The History of Lempster, New Hampshire by Jonathan Nelson and Dorothy Hathaway's thesis from 1985.

Historic Sites via Research and Public Input

With such a long and rich history, it is difficult to summarize all of Lempster's historic sites. This inventory relied on several sources for determining the historic sites. These sources included a Master's thesis written by Dorothy Hathaway in 1985, public input obtained during the 2010 Old Home Day as well as existing maps from various locations. The historical sites that the Conservation Commission requested to be included are old schools, mills, dams, cellar holes and other buildings of local importance. The process, of obtaining public input, was meant to both include the public in the NRI process and also to gather the citizen knowledge of lesser known historic locations. The following is not a comprehensive list of historic locations, since an entire thesis could be conducted on just these sites. All of the historical and cultural locations are shown in a map located in the Appendix of this document (Historical and Cultural Map).

Below is a list of locations that were obtained at the 2010 Lempster Old Home Day.

1) Camp Echo, Sand Pond

2) Cellar Holes (4)

3) Old Mills (2)

4) Old Nail Mill

5) Sucker Huntley Cellar Hole

6) Mica Mine, Ice House, Cellar Hole

7) Silver Mountain

8) Old Spring that feeds several houses.

9) Old Pound

Historic Dams and Mills

Old mills and dams were located by using a map in Dorothy Hathaway's thesis (Hathaway, 1985). The map was compiled by Dick Diehl and Bud McCullough and is references as Figure 20 in Hathaway's thesis. I used these approximate locations and overlaid the river and stream GIS layer found in GRANIT. This allowed me to more accurately depict the true locations of the dams in relation to the stream/river location. That being said, these locations are still approximate and have had no ground truthing. As part of another citizen science project or a school related project, these sites could be ground truthed with a GPS to get a more accurate map.

2. Cultural Resources

Recreational Resources

There are a wide range of recreational resources and opportunities within the town of Lempster, NH. I have compiled a list that is not limited to hiking, wildlife watching, snowmobiling, fishing, cross-country skiing, biking, swimming, boating, scenic vistas for photography and scenic drives. It seems to offer something for every outdoor enthusiast. Below is a more in depth explanation of some of the more popular recreation activities and locations.

Silver Mountain Trail:

Silver Mountain was recently protected as part of the Ashuelot River Headwaters Forest Project. The easement is owned by the Society for the Protection of New Hampshire Forests and contains many trails for biking and hiking during the summer and snowshoeing and cross country skiing during the winter months. On top of the mountain is a large wild blueberry patch that is popular with the locals and visitors alike. At the summit, there is also a great view in all directions, suggesting a great photo opportunity. The trail system includes the following forest cover types: spruce/fir, beech/oak, other hardwoods, mixed forest, and an open summit.

Duck Pond Nature Trail:

Duck Pond Nature Trail is another local favorite with access via the trailhead on Long Pond Road. It is a relatively short walk with ample opportunities for wildlife viewing. There are various land cover types including but not limited to: forested wetlands, open wetlands, spruce/fit, hardwoods, hemlock, and paper birch /aspen.

Beyond these well defined hiking trails, there are many other multi-use trails located throughout Lempster. These are mainly open and passable during the winter months via snowmobile, snowshoes or cross country skiing. For a map of this trail network, please contact the local snowmobile club.

Lakes and Ponds

Sand Pond and Long Pond are Lempster's two largest water bodies. They offer swimming, boating, fishing, wildlife viewing, and plenty of scenic views. Both have ample amounts of undeveloped shoreland, offering a sense of solitude and connection with nature. Their scenic nature and clarity of the water make these two lakes very popular with kayakers fishing, and boating.

Long Pond has a public boat launch as well as a resident’s only beach and picnic area. There is conserved land on the southwestern shore (Conserved Land Map in Appendix). A copy of the bathymetric map produced by the New Hampshire Fish and Game Department is located in the appendix of this inventory.

Sand Pond has a public boat launch that allows access. There is conserved land on the northeastern shore (Conserved Land Map in Appendix). A copy of the bathymetric map produced by the New Hampshire Fish and Game Department is located in the appendix of this inventory.

Though much smaller, Dodge Pond also offers recreational opportunities. Dodge Pond offers a rudimentary boat launch as well as public access along Mountain Road. A copy of the

bathymetric map produced by the New Hampshire Fish and Game Department is located in the appendix of this inventory.

Hurd Pond is one of Lempster's smallest waterbodies at 14 acres in size. There is conserved land on the northern edge from the Odell Easement. None of the shoreland is developed, making this one of the few ponds in the area with no development.

Beyond fishing in one of Lempster ponds, there are many miles of streams, rivers and brooks to fish in as well. These brooks are resources not just for fishing but also for wildlife viewing and scenic, off the beaten path, walks.

Conserved and Public Land

With conservation and land protection being such a high priority of the Lempster Conservation Commission, an inventory would not be complete without outlining the conserved land within and around Lempster. There are 18 tracts of lands with conservation protection at some level (Table 14) totaling 3460 acres. This means that approximately 16.5 % of Lempster land area is in conserved land. The most recent and largest land conservation effort was conducted by the Society for the Protection of New Hampshire Forest. They successfully conserved two tracts of land totaling 1852 acres of land in the Upper Ashuelot River Headwaters Forest (Conserved Land and Undeveloped Shoreland Map). The first tract, measuring 1404 acres, is located along Mountain road towards Bean Mountain. The second, at 440 acres, is located along South Road between Long Pond and Sand Pond. This was a very successful effort at conserving land within the Cardigan to Quabbin Corridor project (Q 2 C). Beyond the effort of organizations like SPNHF, the town of Lempster has successfully conserved 7 tracts of land that total 980 acres of conservation land. For more information about this initiative, please visit: http://q2cpartnership.org/

The Quabbin to Cardigan Initiative is a collaborative landscape scale effort to conserve the land between Cardigan Mountain in New Hampshire and the Quabbin reservoir in Massachusetts. This area encompasses about 2 million acres and is one of the largest remaining areas of intact, interconnected, ecologically significant forests in New England (Figure 4).

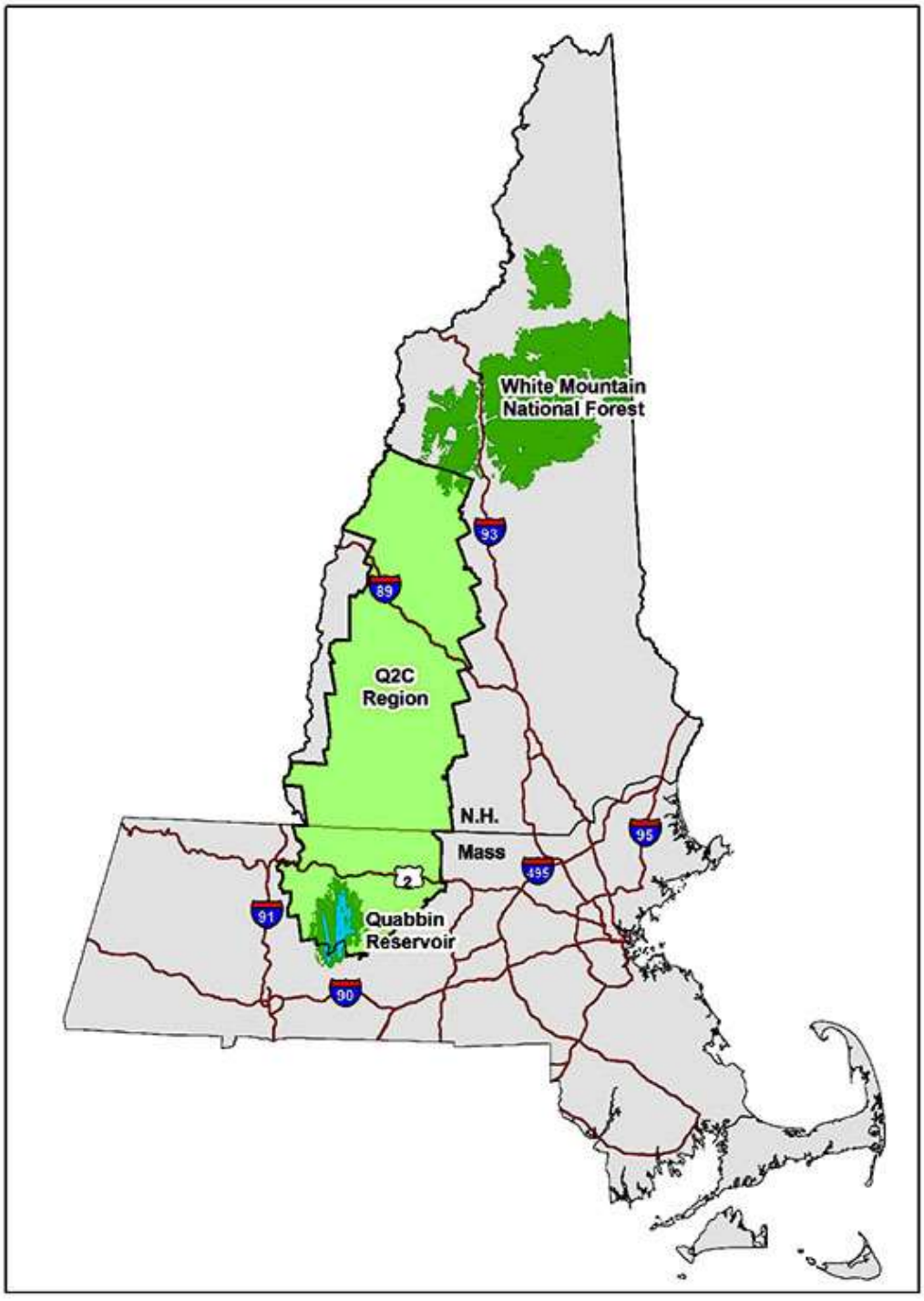

Figure 4. Quabbin to Cardigan Initiative. Source: http://q2cpartnership.org/

Table 14. Conserved and Public Lands and associated area in acres within Lempster, NH.

Conserved and Public Lands:	Area (Acres)
Pillsbury State Park	1
Acworth Town Wetland	1
Schendler Easement	1
Crescent Lake Fish Barrier	2
Gallop Marsh WMA	14
Dodge Hollow Tract	34
Grenier Easement	40
Lempster Town Forest	41
Town of Lempster Parcel	74
Odell Easement	89
Lempster Town Forest (Perkins Lot)	94
Lempster Town Forest (Perkins Lot)	127
Honey Brook State Forest	154
Grenier Easement	157
Dodge Brook State Forest	226
Long Pond Town Forest	283
Long Pond Town Forest	361
Ashoelot River Headwaters Forest	448
Ashoelot River Headwaters Forest	1404
Total Acres Conserved	**3551**

Source: GRANIT and SPNHF database.

Scenic Vistas

As part of the Natural Resource Inventory, the Lempster Conservation Commission decided to incorporate a Scenic Vista and Viewshed Analysis. This is partly due to the common theme that one of Lempster's finest qualities is the scenery. The Master Plan had a section devoted to the various scenic vistas in town. This list of scenic vistas, from the Master Plan, was used as a basis for the viewshed analysis. The following points were located via GPS, which show scenic vistas from public locations. These public locations are mainly along roads and other non-private scenic locations:

1) Top of Mountain Road

2) South Road

3) Dodge Hollow Road *

4) NH Route 10

5) Benway Hill Road *

6) Grandview Road *

7) Bean Mountain Road

8) Nichols Road *

9) Waldron Road Extension

10) Lempster Street

Those locations with an asterisk (*) had the largest viewshed and were incorporated into the final viewshed analysis (Scenic Vista and Viewshed Analysis in Appendix).

Scenic Vista and Viewshed Analysis

To create an analysis of the viewsheds, the first step was to locate the vistas via handheld GPS and plot these on a Digital Elevation Model within a GIS based map. Once these locations were plotted, a series of steps were completed within Arcview GIS to show the viewshed from each location. The area, in acres, was calculated for each viewshed. For the sake of this analysis, the four largest Viewsheds with the most visible acres were used for the final analysis. The last step was to create an intersection of the area where all four viewshed's were located. This gives a common area that is seen from the top four scenic vistas (Scenic Vista and Viewshed Analysis in Appendix). It is depicted as the Viewshed Composite in the Scenic Vista map. This layer may be used in a final co-occurrence map to prioritize conservation efforts. In the future, this information could be used for conservation, development and land use planning purposes.

Lempster Wind Farm

The Lempster Wind Farm is New Hampshire's first modern commercial scale wind farm. It came online in November of 2008 and can generate 24 megawatts of electricity. It contains 12 Gamesa wind turbines situated along a privately owned ridgeline. It is projected to provide enough energy for 10,000 New Hampshire homes which offsets the CO_2 emissions equivalent to taking 5,700 cars off the road each year (Iberdrola). The project encompasses approximately 1500 acres yet directly impacts 5% of that land. All of the electricity will be purchased by Public Service of New Hampshire (PSNH) who is selling a portion to New Hampshire Electric Cooperative as the local Lempster provider. During construction, it employed 120 construction

jobs and will sustain approximately 3-4 permanent operations and maintenance jobs. The initial feasibility study began in 2003. The New Hampshire Site Evaluation Committee approved the project in June of 2007. Construction on the project began in December of 2007 and finished in the fall of 2008.

Recommendations:

The aim of this project is to inventory the natural and cultural resources in Lempster, NH. The goals and values of the Conservation Commission are reflected in the content of this document. The following are recommendations for prioritizing conservation efforts, engaging residents in citizen science activities, sustainable stewardship and continued updating of this baseline inventory.

Water resources

I recommend protecting the undeveloped and unprotected shorleland as a priority. The value of these resources cannot be understated for both natural and cultural values. Of these areas, I would suggest trying to protect the northern side of Long Pond. The area from Blue Heron Drive to half way down the western side of the lake is undeveloped and unprotected. By protecting this area, you not only protect the shoreline from development but also connect the Long Pond Town Forest Easement to the Ashuelot River Headwaters Forest Easement. Please refer to the map located in the Appendix labeled Conserved Land and Undeveloped Shoreland.

The second undeveloped and unprotected shoreland that I would recommend protecting is the southern half of Hurd Pond. The Odell Easement has protected the northern half and the southern half is unprotected. If protected, it would allow Hurd Pond to remain completely undeveloped and protected. Another benefit of this would be a means to connect the Odell Easement with the Grenier Easement which is one of the other goals of the LCC. Please refer to the map located in the Appendix labeled Conserved Land and undeveloped Shoreland.

Wildlife

Wildlife and it associated values has been a consistent theme among the LCC. Protecting wildlife habitat has been one of the values of both the LCC and the Lempster Master Plan. The Wildlife Action Plan, created by NHFG, maps the highest ranked habitat in New Hampshire, the biological region and its supporting landscapes. The overwhelming majority of this highest ranked habitat in Lempster is located along the eastern side of the town. More specifically, it is from the Bean Mountain and Silver Mountain Ridgeline, easterly towards Washington. I would

recommend protecting any and all areas within this area. Please refer to Figure 2 for a visual representation of this.

Another key element to protecting wildlife habitat is to create linkages and connections between conserved land. Conservation efforts should be focused on the following areas:

- Northern side of Long Pond
- Connections between Honey Brook State Forest, Dodge Brook State Forest, and the southern Ashuelot River Headwaters Forest.
- The Northern side of the northern Ashuelot River Headwater Forest and Pillsbury State Park along the eastern edge of the windmills.
- Between the Odell Easement , the Grenier Easement and the Lempster Town Forest.

These gaps and linkages can be seen in the Conserved Land and Undeveloped Shoreland map located in the appendix.

Unfragmented forest blocks are another value of the LCC. The largest unfragmented blocks of forest correspond very closely with the highest ranked wildlife habitat in the WAP. That reinforces the importance of protecting this area, east of the Bean and Silver Mountain ridgeline.

Since the scope of this inventory was on a large scale, I would recommend taking this inventory to the next level. Vernal pools are very difficult to identify from satellite imagery. I recommend creating a citizen science program to inventory the vernal pools in the town owned forests. These citizens could be LCC members, interested residents or supervised students. The vernal pools, once located on foot, can be located with a GPS unit and monitored yearly.

Soils

Since soils loss and degradation is an ongoing issue across the country, I would make every effort possible to conserve the important forest and agricultural soils in town. It is difficult to point to a particular area for protection since these soils are widely distributed. What I would recommend is to encourage residents with prime agricultural soils to conserve their land or convert their forested lands to agricultural lands. Those residents with prime forest soils should be encouraged to harvest and plant species that are ideally suited for their particular soils. This could be done either with a mailer or a mention at a town meeting.

Historic

The biggest downfall of the information I gathered on the old mill and dam's site in town was the relative inaccuracy of their locations. I would recommend another citizen science program to locate these site with a GPS unit. Once located with GPS, the information could be made public as a GIS layer or a map on the Lempster Town website. There may be residents who would enjoy visiting these old sites and an interactive map may be an easy way to accomplish that. Please refer to the map in the Appendix labeled Cultural and Historic Inventory.

Cultural

The value of scenic vistas and viewshed has been another common theme with both the LCC and the Master Plan. The viewshed analysis has shown that the most viewed and visible areas to be on the western slope of the ridgeline running between Bean Mountain and Silver Mountain. This occurs generally between 1600 and 2100 feet in elevation. Please refer to the map in the appendix labeled Composite Viewshed Analysis for a visual representation. It is my recommendation that any areas within this viewshed should have a conservation priority. I also recommend limiting any development in this area as it would negatively impact the view from many locations in town.

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Appendix

Maps Included in the Appendix created by Martin Bean

1) Conservation and Undeveloped Shoreland Map *

2) Important Agricultural and Forest Soils Map *

3) Important Agricultural Soils

4) Important Forest Soils

5) Historic and Cultural Resource Map *

6) Benway Hill Road Viewshed

7) Dodge Hollow Road Viewshed

8) Grandview Road Viewshed

9) Nichols Road Viewshed

10) Scenic Vista and Viewshed Analysis *

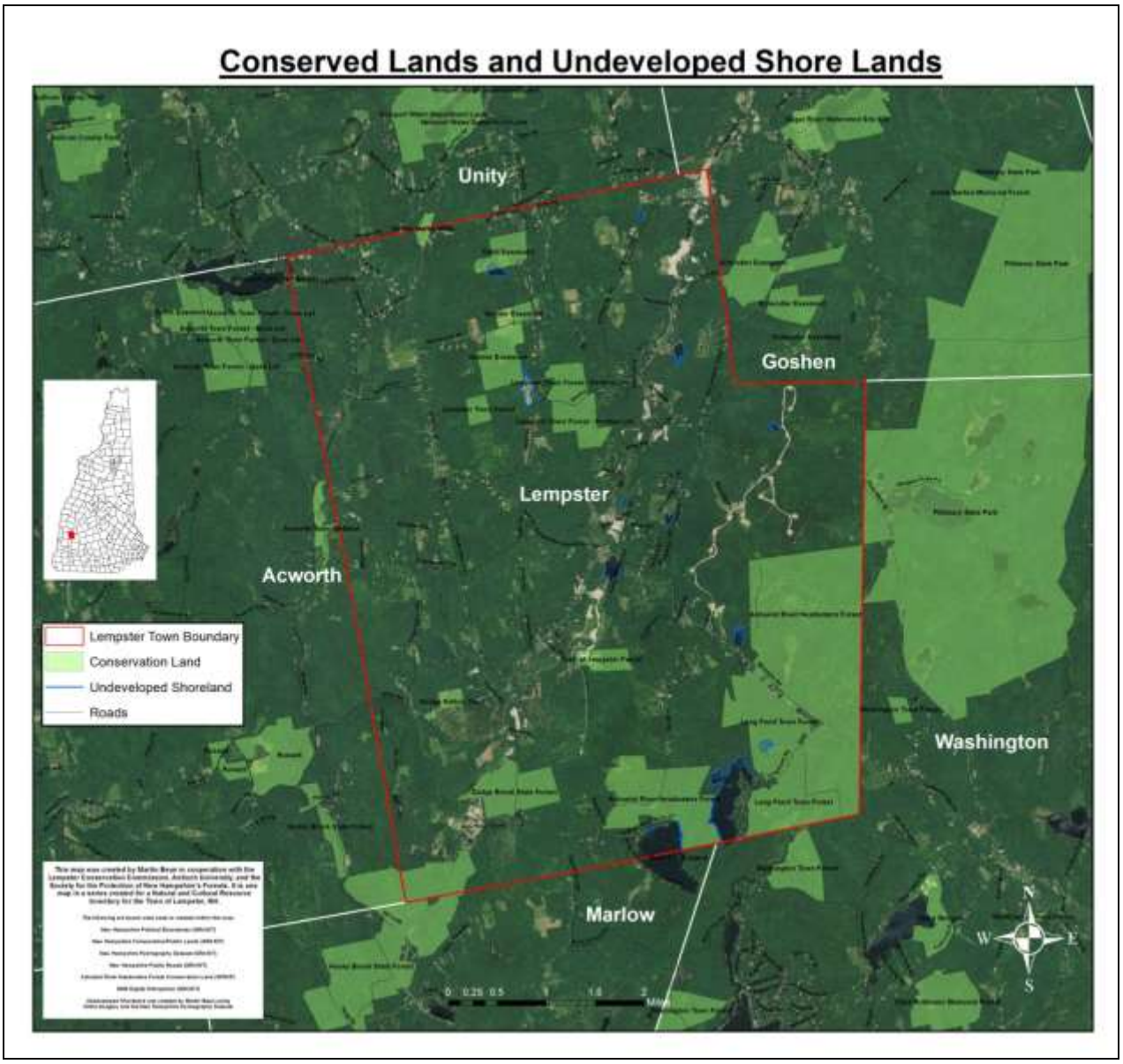
* These maps were designed to be printed and displayed at a 36” x 34” format.

Maps included in the Appendix from New Hampshire Fish and Game Department

1) Bathymetric Map of Long Pond

2) Bathymetric Map of Sand Pond

3) Bathymetric Map of Dodge Pond


Conserved Lands and Undeveloped Shore Lands
Unity
Goshen
Lempster
Acworth
Washington
Marlow
Lempster Town Boundary
Conservation Land
Undeveloped Shoreland
Roads
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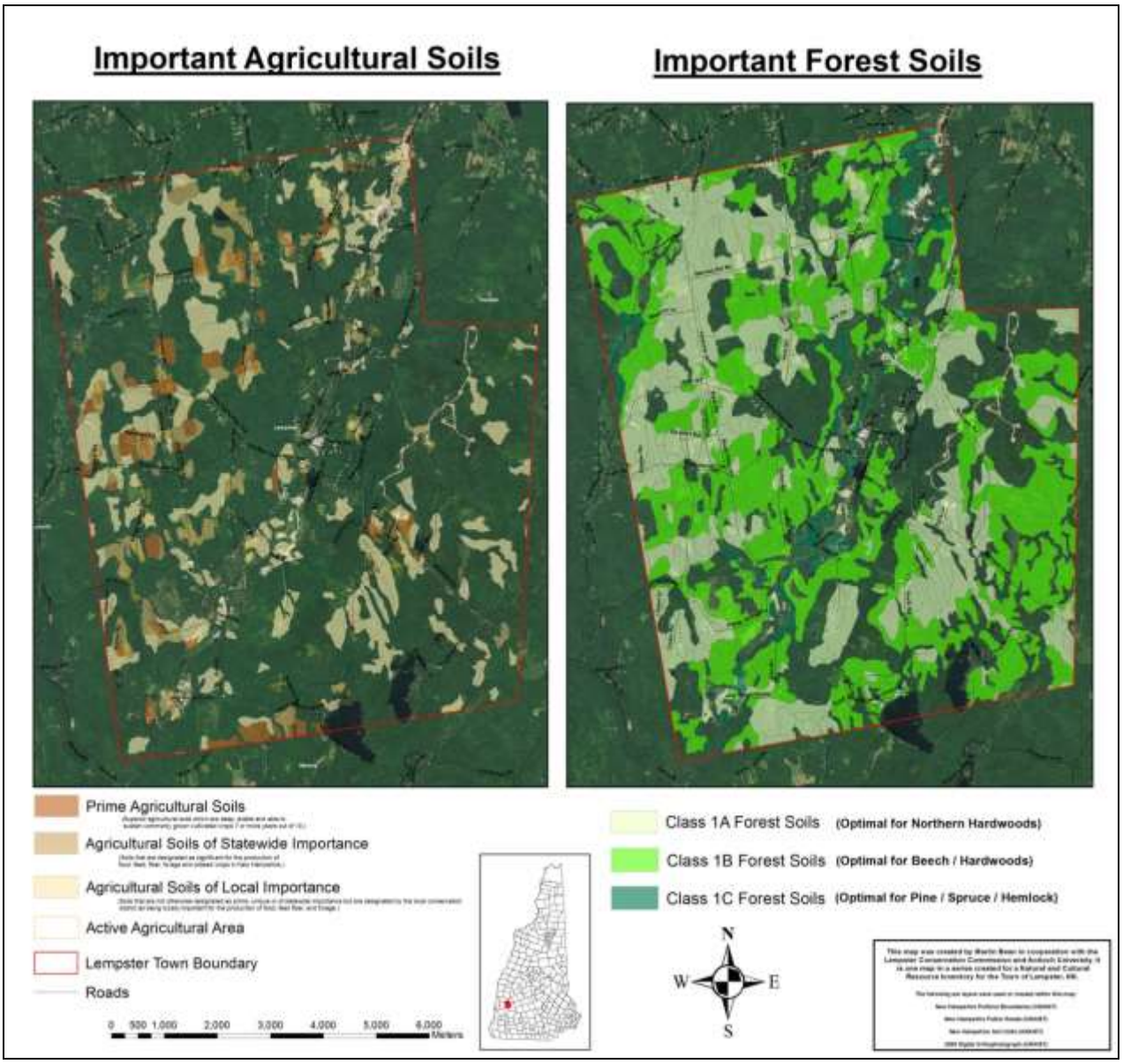
Important Agricultural Soils
Important Forest Soils
Prime Agricultural Soils
Agricultural Soils of Statewide Importance
Agricultural Soils of Local Importance
Active Agricultural Area
Lempster Town Boundary
Roads
0 500 1,000 2,000 3,000 4,000 5,000 6,000
Meters
Class 1A Forest Soils (Optimal for Northern Hardwoods)
Class 1B Forest Soils (Optimal for Beech / Hardwoods)
Class 1C Forest Soils (Optimal for Pine / Spruce / Hemlock)
N
W
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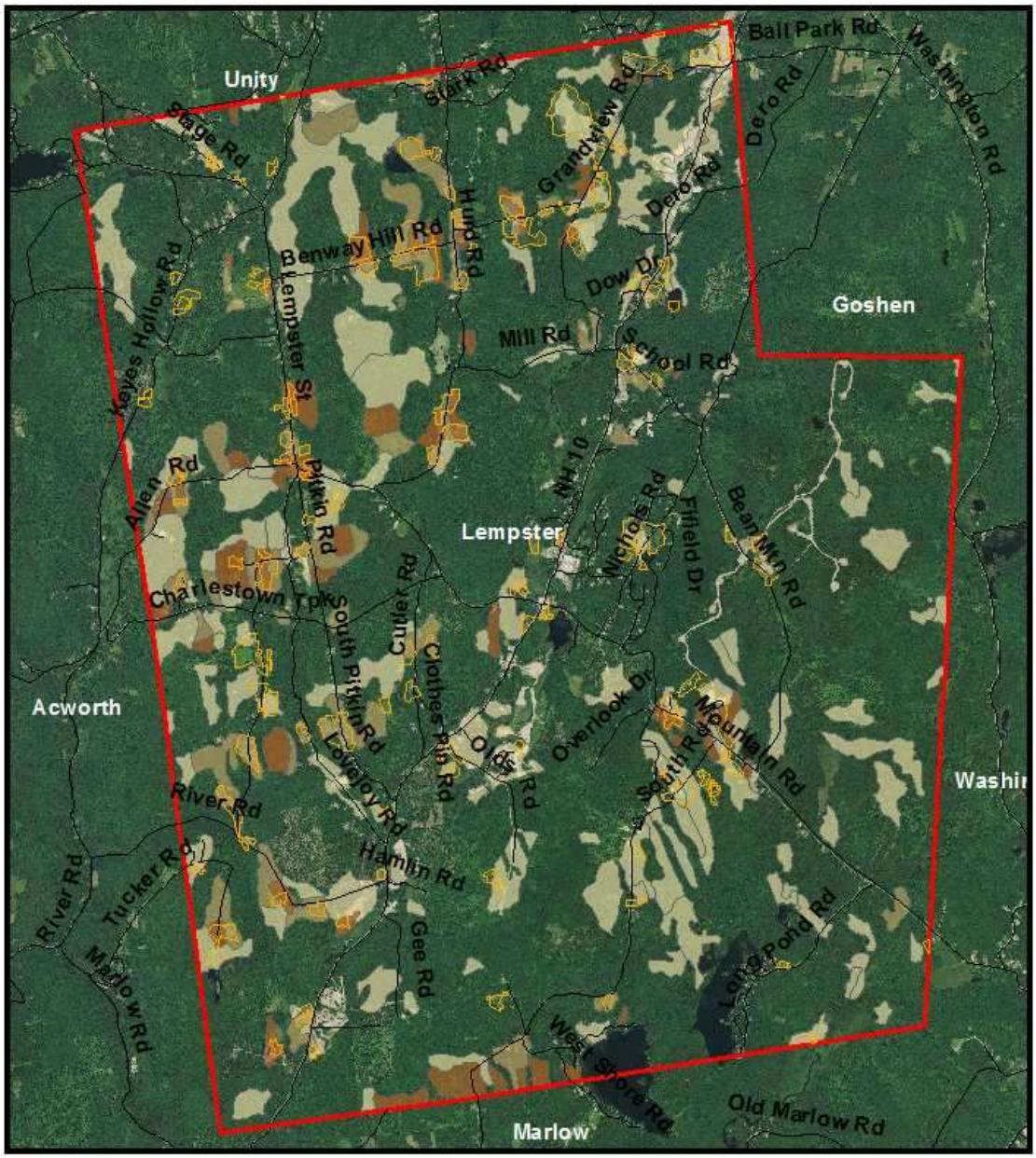
Important Agricultural Soils



Prime Agricultural Soils

Agricultural Soils of Statewide Importance

Agricultural Soils of Local Importance

Active Agricultural Area

Lempster Town Boundary

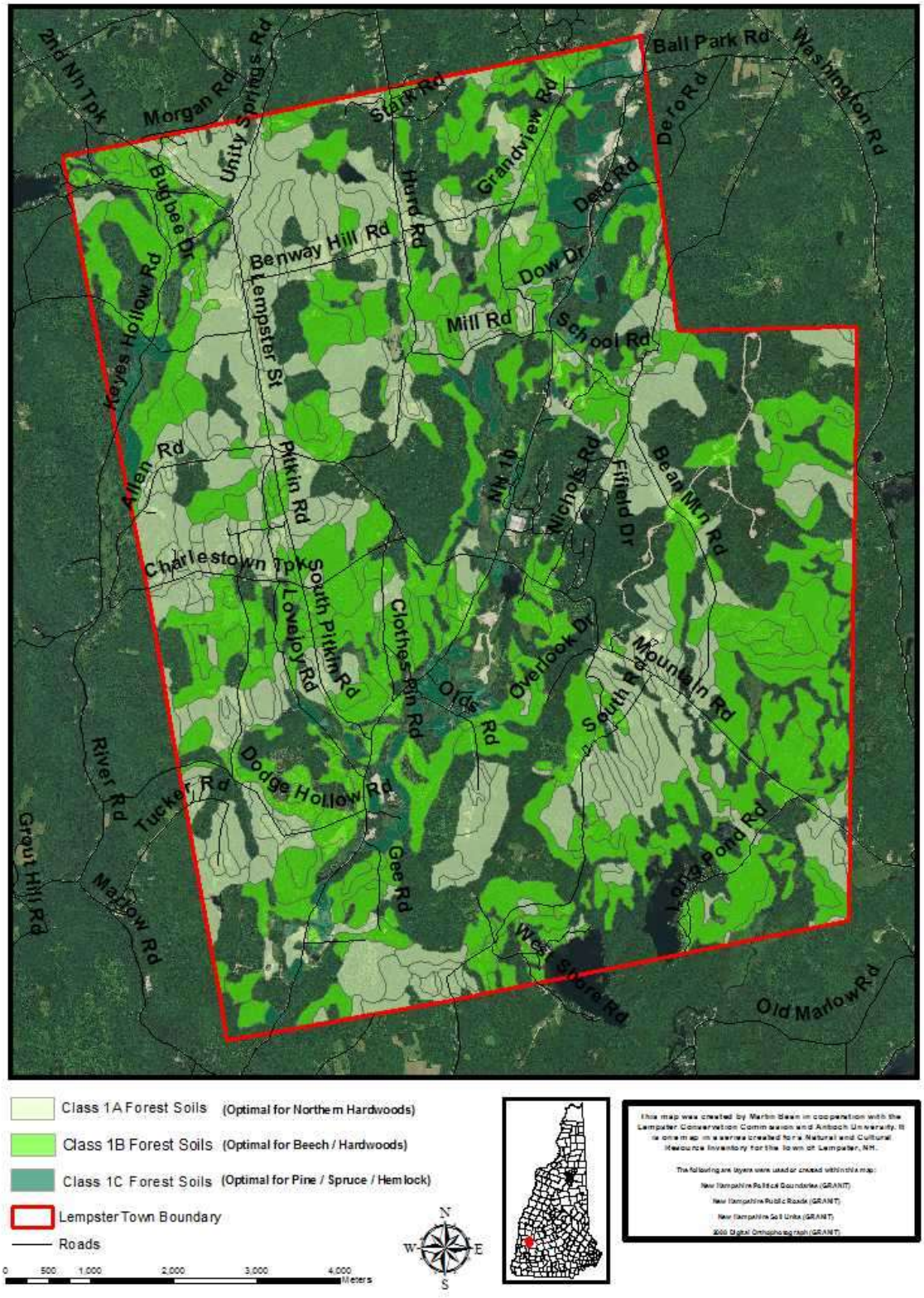
Roads

N W E S

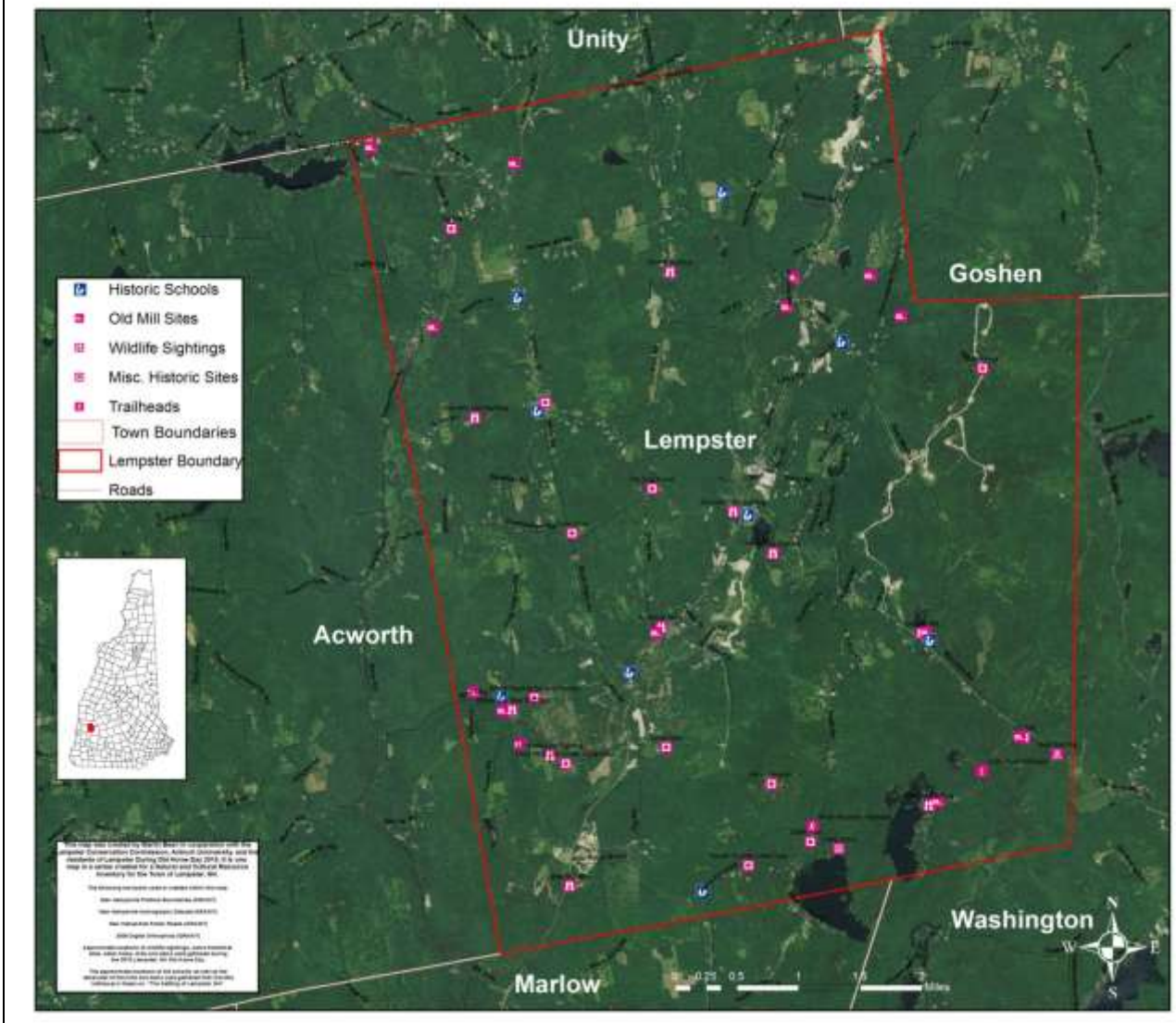
This map was created by Martin Bean in cooperation with the Lempster Conservation Commission and Antioch University. It is one map in a series created for a Natural and Cultural Resource Inventory for the Town of Lempster, NH.

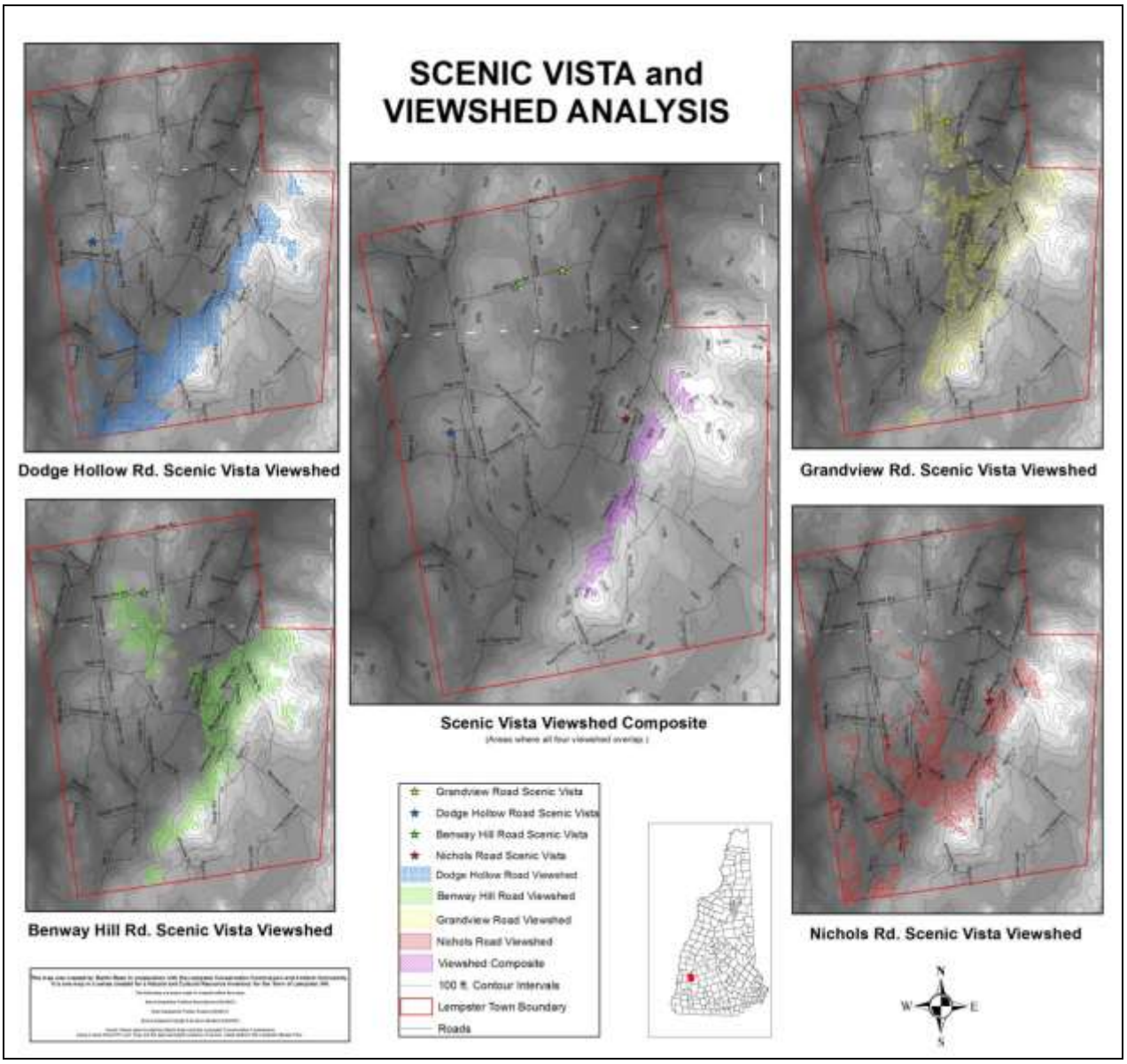
0 500 1,000 2,000 3,000 4,000 Meters

Important Forest Soils



Cultural and Historical Features




SCENIC VISTA and
VIEWSHED ANALYSIS
Dodge Hollow Rd. Scenic Vista Viewshed
Grandview Rd. Scenic Vista Viewshed
Scenic Vista Viewshed Composite
Benway Hill Rd. Scenic Vista Viewshed
Nichols Rd. Scenic Vista Viewshed
Grandview Road Scenic Vista
Dodge Hollow Road Scenic Vista
Benway Hill Road Scenic Vista
Nichols Road Scenic Vista
Dodge Hollow Road Viewshed
Benway Hill Road Viewshed
Grandview Road Viewshed
Nichols Road Viewshed
Viewshed Composite
100 ft. Contour Intervals
Lempster Town Boundary
Roads
N
W
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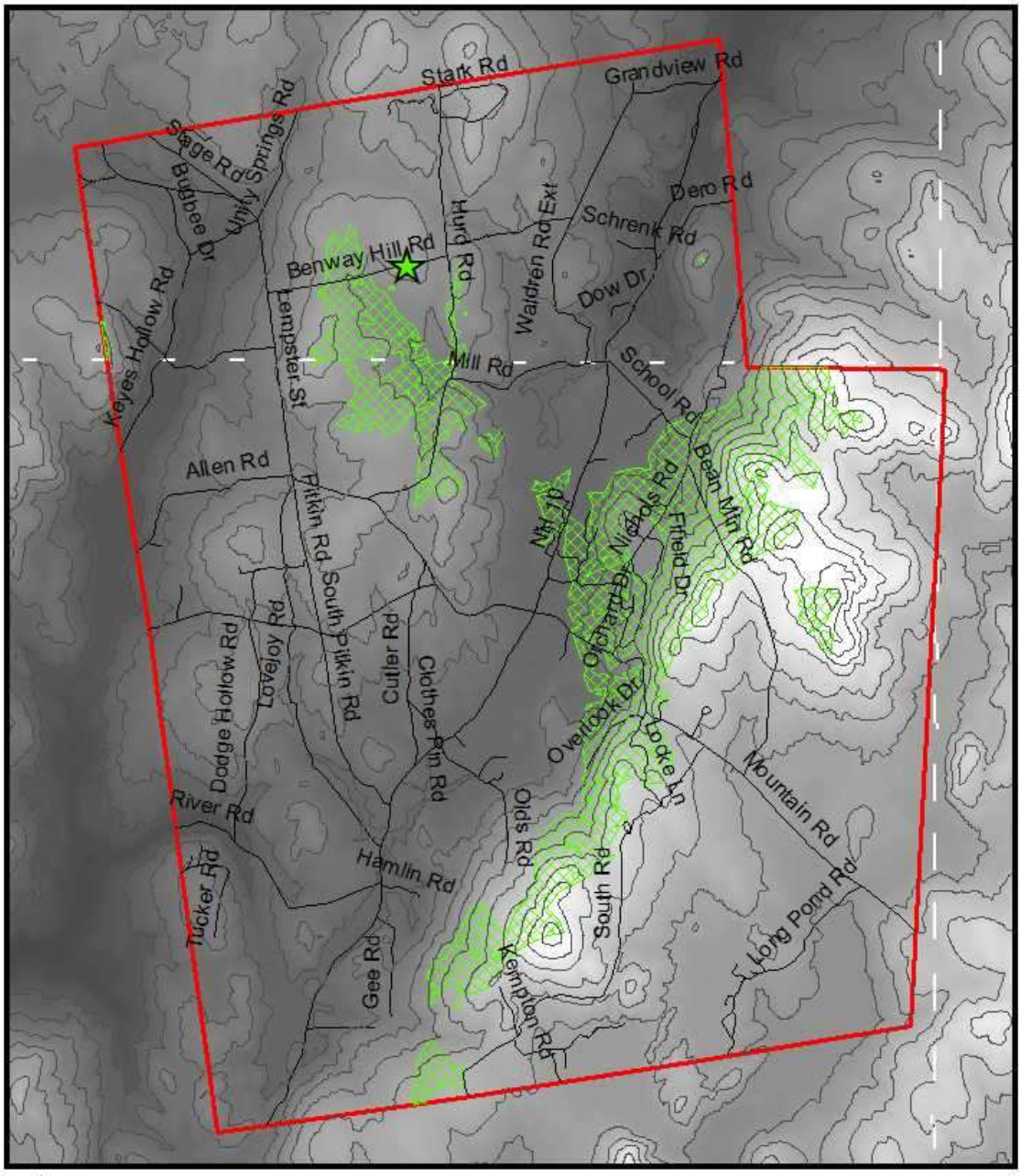
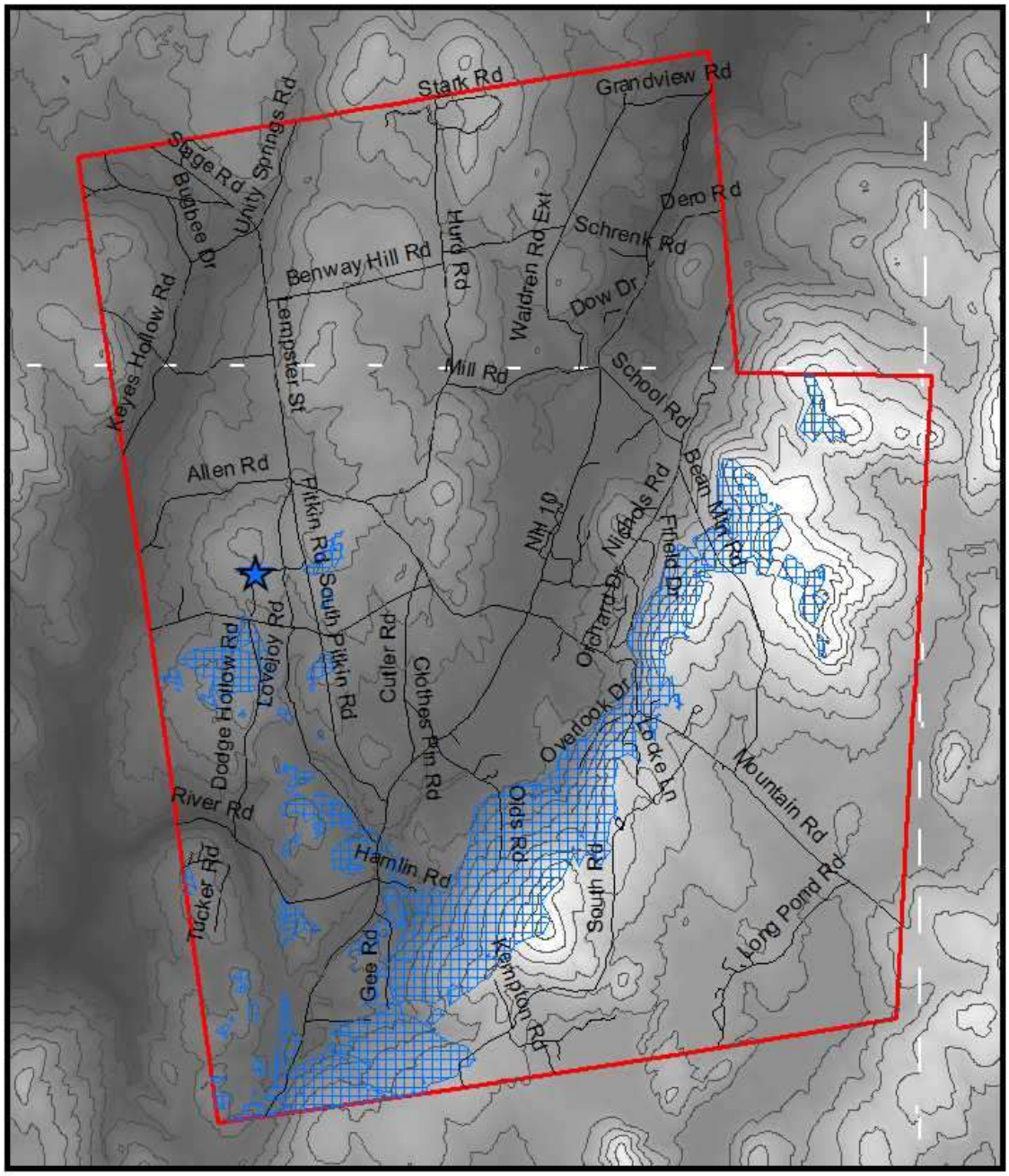
Benway Hill Road Scenic Vista and Viewshed



Dodge Hollow Scenic Vista and Viewshed

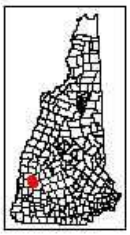


Scenic Vista

Dodge Hollow Road Viewshed

Lempster Town Boundary

Roads

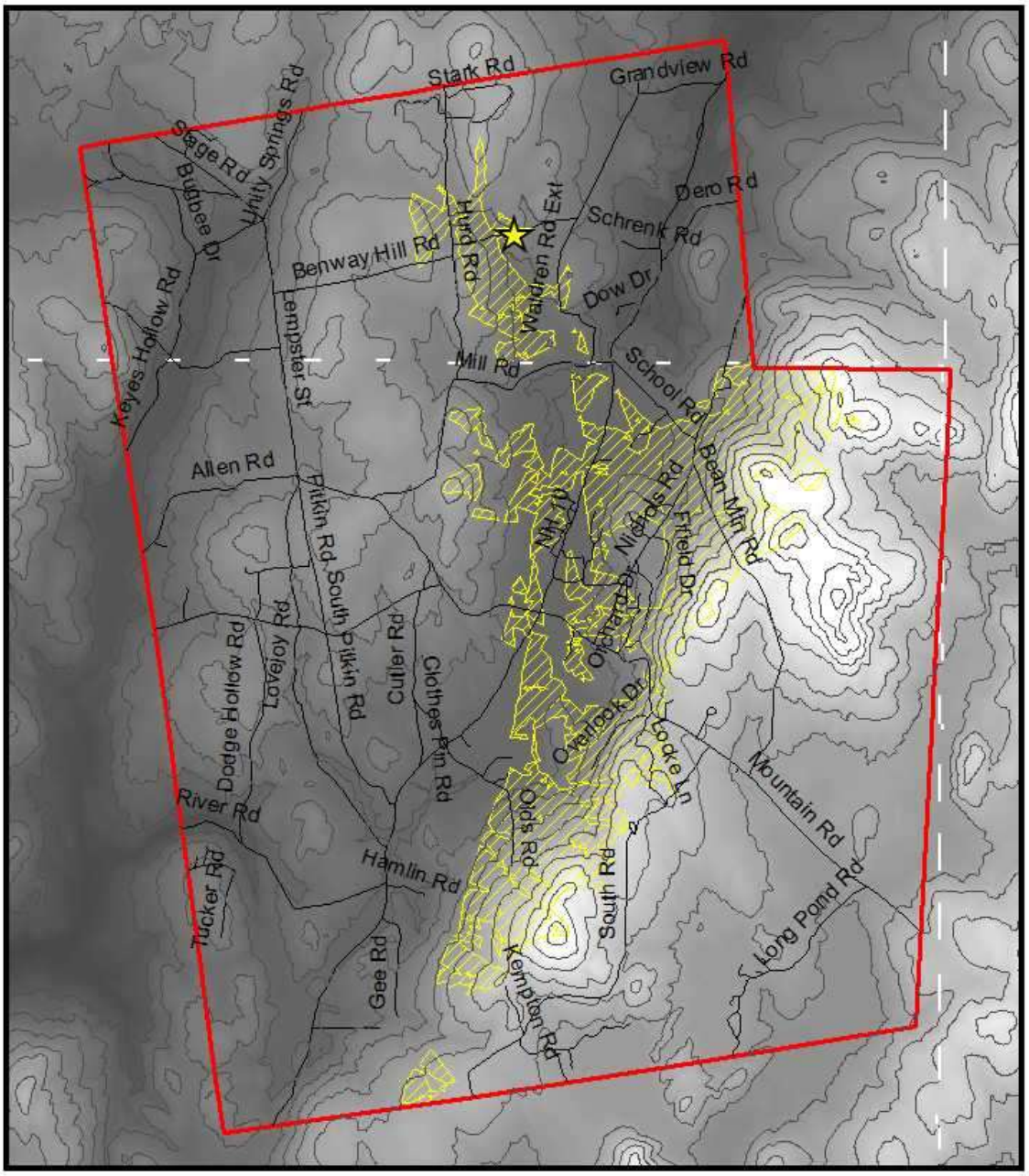


This map was created by Martin Bean in cooperation with the Lempster Conservation Commission and Antioch University. It is one map in a series created for a Natural and Cultural Resource Inventory for the Town of Lempster, NH.

The following are layers used or created within this map:
New Hampshire Political Boundaries (GRANIT)
New Hampshire Public Roads (GRANIT)
New Hampshire Digital Elevation Models (GRANIT)
Scenic Vistas were located by Martin Bean and the Lempster Conservation Commission using a hand held GPS unit. They are the approximated locations of scenic vistas listed in the Lempster Master Plan.

0 500 1,000 2,000 3,000 4,000 Meters

Grandview Road Scenic Vista and Viewshed

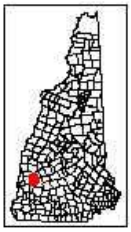


Scenic Vista

Grandview Road Viewshed

Lempster Town Boundary

Roads



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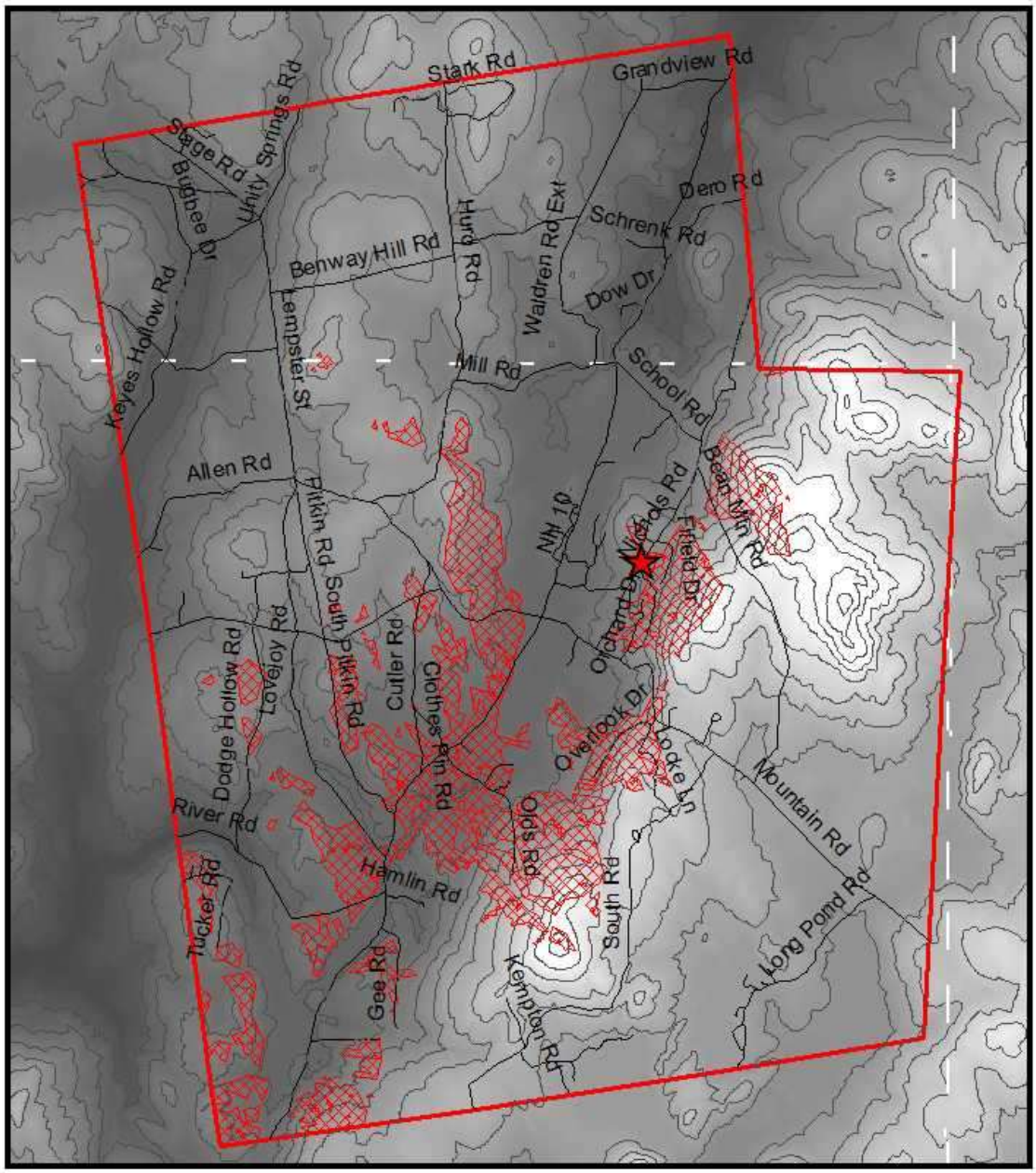
0 500 1,000 2,000 3,000 4,000 Meters

Nichols Road Scenic Vista and Viewshed

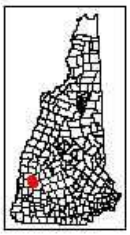


Scenic Vista

Nichols Road Viewshed

Lempster Town Boundary

Roads



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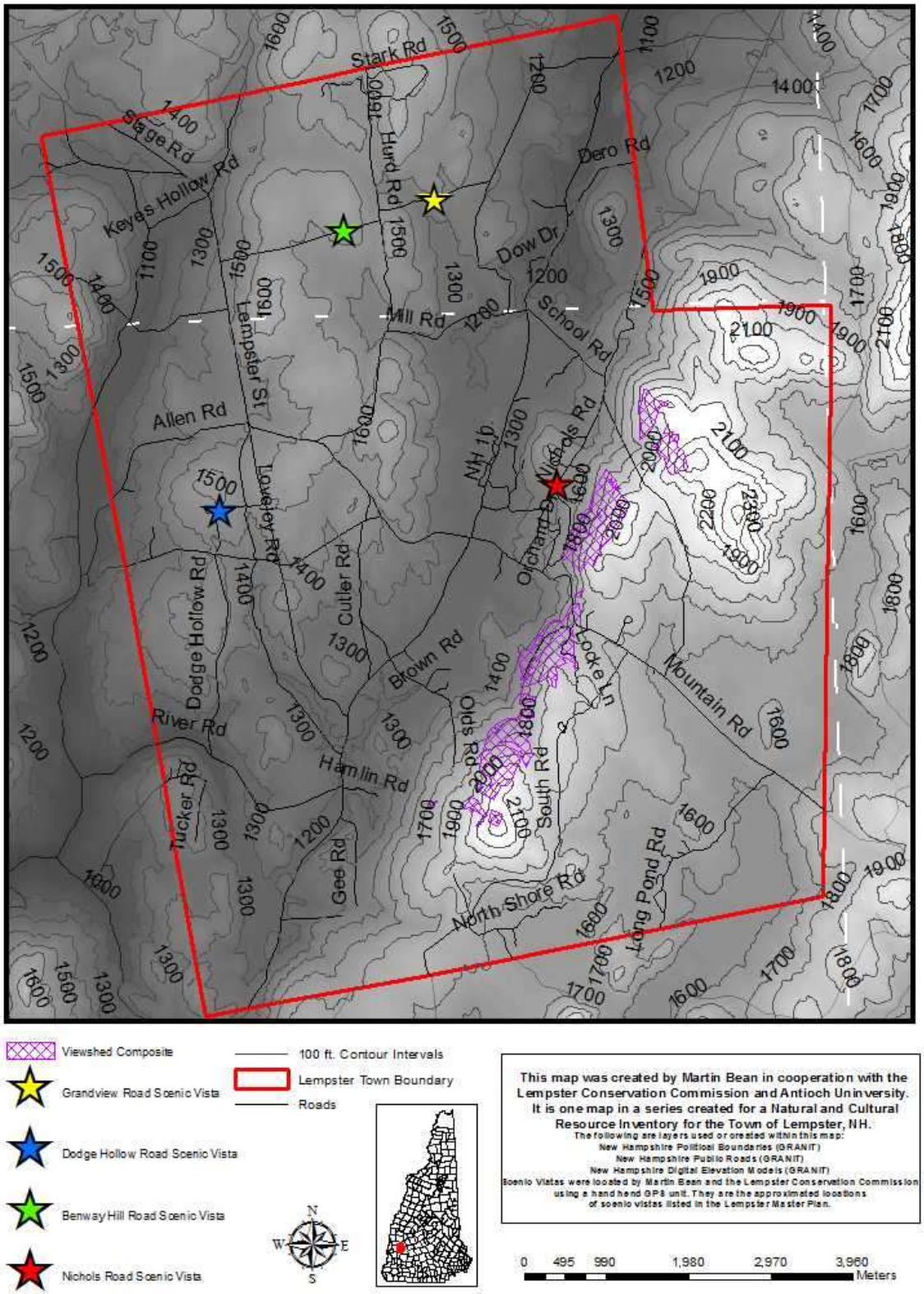
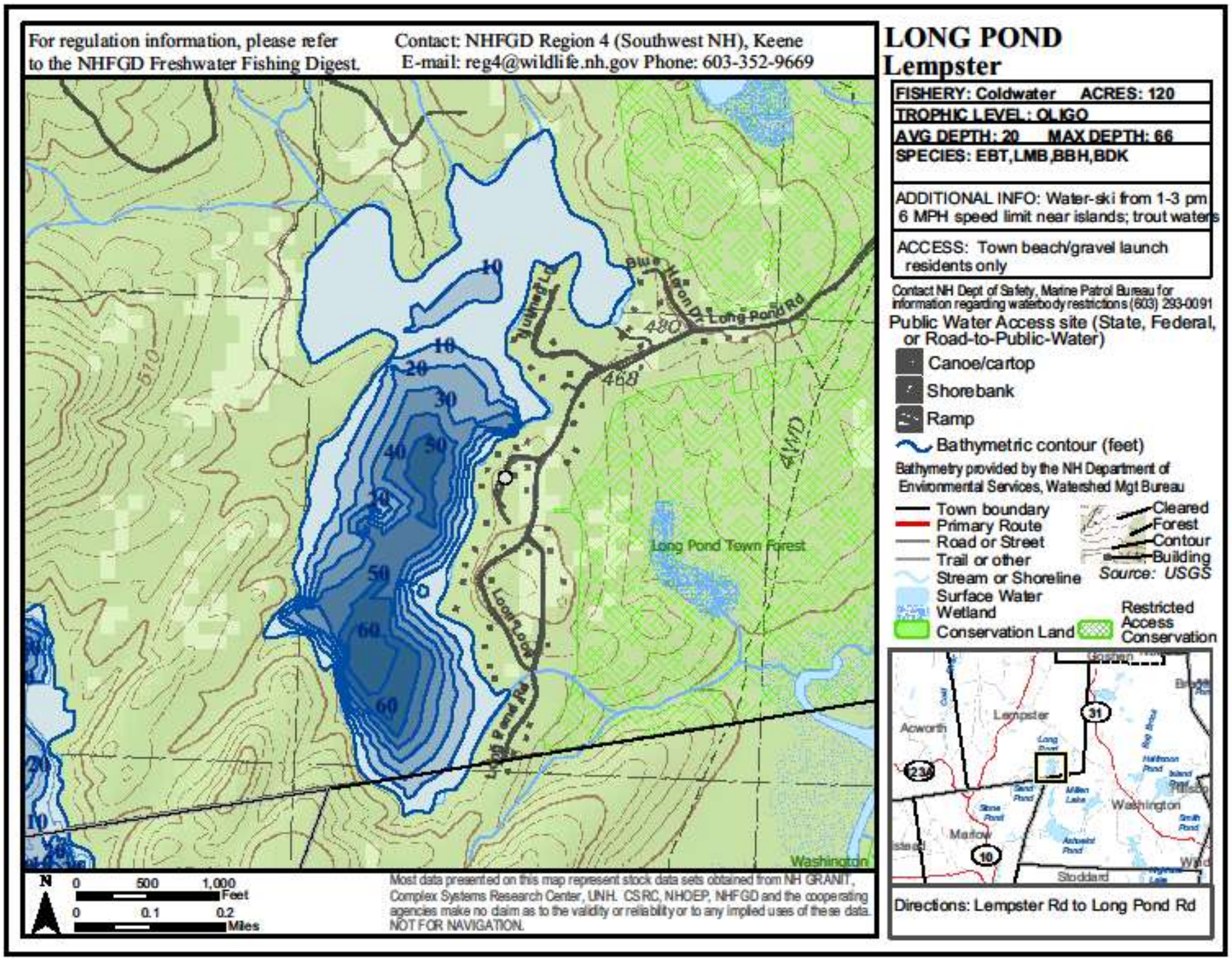
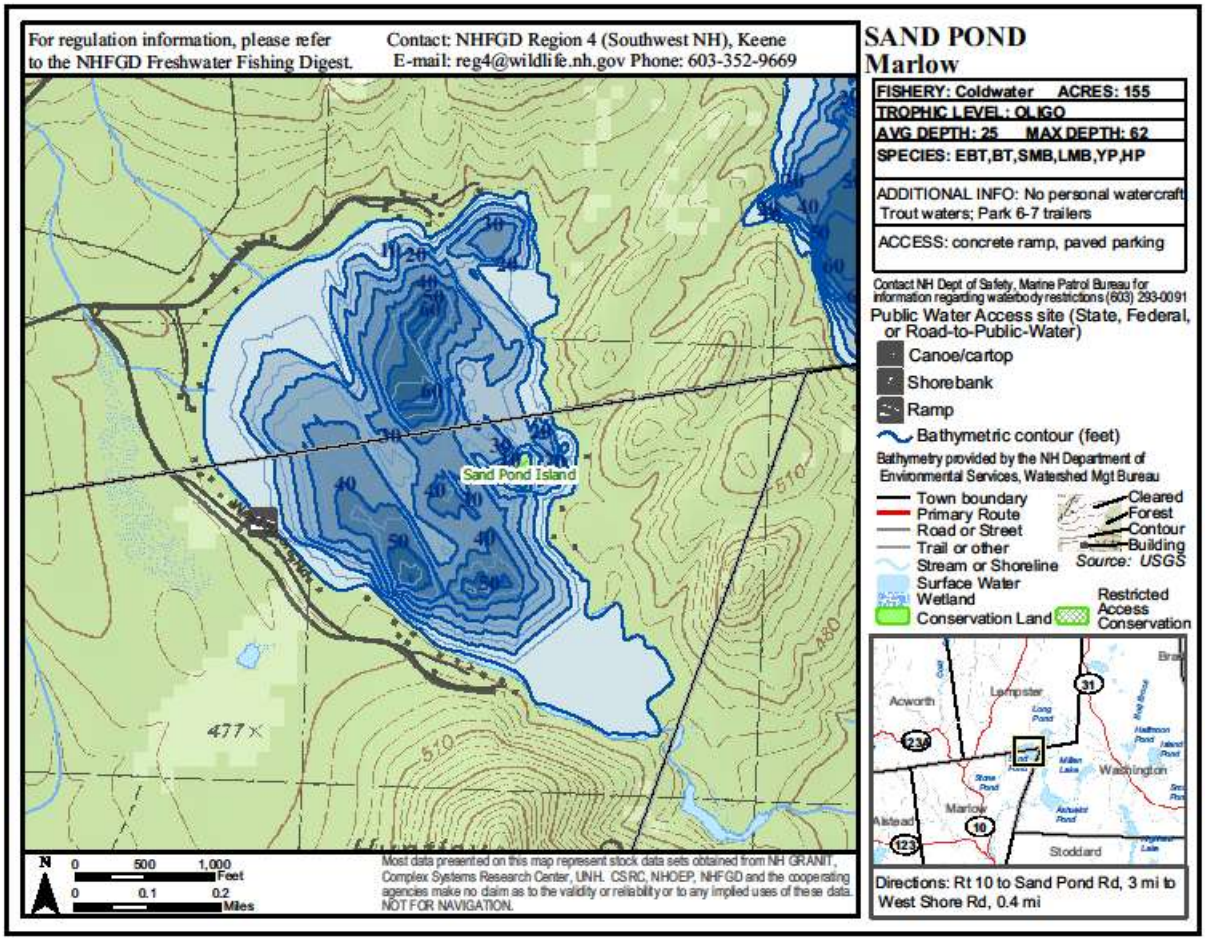
0 500 1,000 2,000 3,000 4,000 Meters

Scenic Vista and Viewshed Analysis




For regulation information, please refer to the NHFGD Freshwater Fishing Digest.
Contact: NHFGD Region 4 (Southwest NH), Keene
E-mail: reg4@wildlife.nh.gov Phone: 603-352-9669
LONG POND
Lempster
FISHERY: Coldwater ACRES: 120
TROPHIC LEVEL: OLIGO
AVG DEPTH: 20 MAX DEPTH: 66
SPECIES: EBT,LMB,BBH,BDK
ADDITIONAL INFO: Water-ski from 1-3 pm 6 MPH speed limit near islands; trout waters
ACCESS: Town beach/gravel launch residents only
Contact NH Dept of Safety, Marine Patrol Bureau for information regarding waterbody restrictions (603) 293-0091
Public Water Access site (State, Federal, or Road-to-Public-Water)
Canoe/cartop
Shorebank
Ramp
Bathymetric contour (feet)
Bathymetry provided by the NH Department of Environmental Services, Watershed Mgt Bureau
Town boundary
Primary Route
Road or Street
Trail or other
Stream or Shoreline
Surface Water
Wetland
Conservation Land
Restricted Access Conservation
Cleared
Forest
Contour
Building
Source: USGS
Long Pond Town Forest
Long Pond Rd
Blue Heron Dr
Loon Loop
Washington
Lempster
Acworth
Marlow
Stoddard
Goshen
Most data presented on this map represent stock data sets obtained from NH GRANIT, Complex Systems Research Center, UNH. CSRC, NHOEP, NHFGD and the cooperating agencies make no claim as to the validity or reliability or to any implied uses of these data. NOT FOR NAVIGATION.
Directions: Lempster Rd to Long Pond Rd


For regulation information, please refer to the NHFGD Freshwater Fishing Digest.
Contact: NHFGD Region 4 (Southwest NH), Keene
E-mail: reg4@wildlife.nh.gov Phone: 603-352-9669
Sand Pond Island
477×
510
480
N
0 500 1,000 Feet
0 0.1 0.2 Miles
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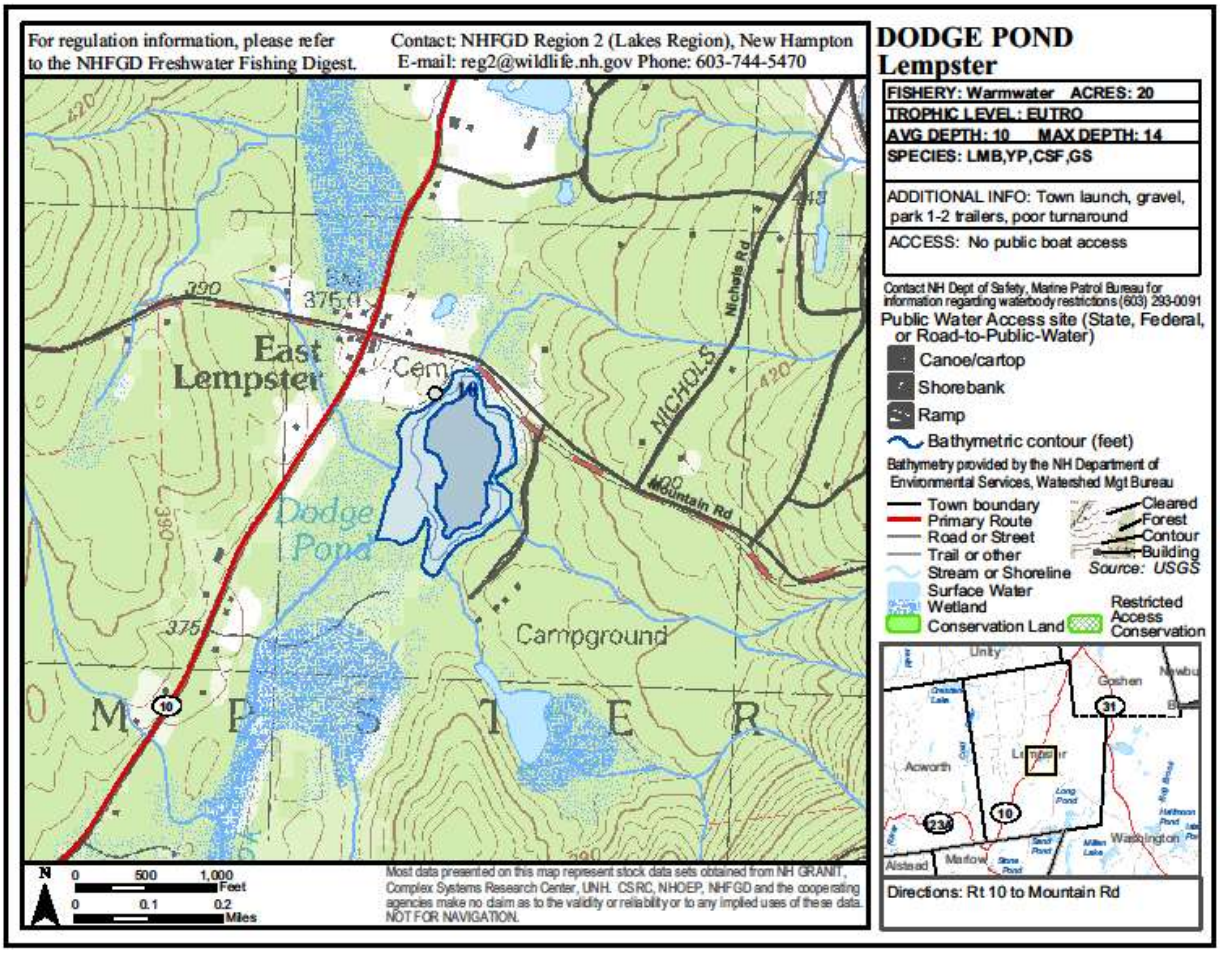
SAND POND
Marlow
FISHERY: Coldwater ACRES: 155
TROPHIC LEVEL: OLIGO
AVG DEPTH: 25 MAX DEPTH: 62
SPECIES: EBT,BT,SMB,LMB,YP,HP
ADDITIONAL INFO: No personal watercraft Trout waters; Park 6-7 trailers
ACCESS: concrete ramp, paved parking
Contact NH Dept of Safety, Marine Patrol Bureau for information regarding waterbody restrictions (603) 293-0091
Public Water Access site (State, Federal, or Road-to-Public-Water)
Canoe/cartop
Shorebank
Ramp
Bathymetric contour (feet)
Bathymetry provided by the NH Department of Environmental Services, Watershed Mgt Bureau
Town boundary
Primary Route
Road or Street
Trail or other
Stream or Shoreline
Surface Water
Wetland
Conservation Land
Cleared
Forest
Contour
Building
Source: USGS
Restricted Access Conservation
Acworth
Lempster
Washington
Marlow
Alstead
Stoddard
31
10
123
Directions: Rt 10 to Sand Pond Rd, 3 mi to West Shore Rd, 0.4 mi


For regulation information, please refer to the NHFGD Freshwater Fishing Digest.
Contact: NHFGD Region 2 (Lakes Region), New Hampton
E-mail: reg2@wildlife.nh.gov Phone: 603-744-5470
DODGE POND
Lempster
FISHERY: Warmwater ACRES: 20
TROPHIC LEVEL: EUTRO
AVG DEPTH: 10 MAX DEPTH: 14
SPECIES: LMB,YP,CSF,GS
ADDITIONAL INFO: Town launch, gravel, park 1-2 trailers, poor turnaround
ACCESS: No public boat access
Contact NH Dept of Safety, Marine Patrol Bureau for information regarding waterbody restrictions (603) 293-0091
Public Water Access site (State, Federal, or Road-to-Public-Water)
Canoe/cartop
Shorebank
Ramp
Bathymetric contour (feet)
Bathymetry provided by the NH Department of Environmental Services, Watershed Mgt Bureau
Town boundary
Primary Route
Road or Street
Trail or other
Stream or Shoreline
Surface Water
Wetland
Conservation Land
Restricted Access Conservation
Cleared
Forest
Contour
Building
Source: USGS
East Lempster
Cem
Dodge Pond
Campground
Nichols Rd
Mountain Rd
MAPSTER
Unity
Goshen
Acworth
Lempster
Washington
Alstead
Marlow
Directions: Rt 10 to Mountain Rd
N
0 500 1,000 Feet
0 0.1 0.2 Miles
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