

**Town of Litchfield
Natural Resources Inventory
and Conservation Plan
2022**

Prepared by the:
LITCHFIELD CONSERVATION COMMISSION

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With the assistance of:
NASHUA REGIONAL PLANNING COMMISSION



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Executive Summary

This plan contains an inventory of the Town's natural, agricultural, scenic, and historic resources. This inventory provides the Conservation Commission with sound information concerning existing and potentially important resources in need of future protection. In addition to the inventory, the Plan also contains information on the relevant federal, state, and local regulations and programs concerned with resource protection. Finally, the Plan identifies priorities for resource management and makes recommendations for actions to improve the level of protection afforded the Town's valuable resources and identifies potential sources of funding for conservation purchases. The Plan is intended to provide the Conservation Commission and other town officials with the information necessary to make wise decisions for short and long term preservation and management of the Town's natural, agricultural, scenic, and historic resources.

This plan aims to achieve the following goals:

- Preserve the visual character of the Town by protecting its natural, historic, scenic, and agricultural resources.
- Promote the conservation, protection, and sound management of the Town's natural resources and wildlife habitat.
- Provide a broad range of recreational opportunities for all ages and user groups.
- Protect and preserve the Town's historic resources.
- Foster strong relationships with property owners.
- Establish relationships with other conservation.

For practical reasons it is not feasible to preserve all key assets, so the following is a list of priority parcels for future protection:

- Conserve Prime Agricultural Land
- Protect Habitat Resources and Create Corridors for Wildlife Protection
- Preserve Scenic Areas
- Protect Unique Natural Resources
- Preserve Key Historic Sites in the Community
- Preserve the Quality of Surface Waters and Groundwater for the Future
- Protect the Character of the Town, especially properties along Route 3A and the Merrimack River

A multifaceted approach will be most successful in looking at future protection of key land parcels in the Town. The following is a list of recommended actions that can be utilized:

- Land Use Controls
 - Maintain existing regulations like the Conservation Open Space Development, Floodplain and Wetlands Conservation Districts.
 - Encourage innovative land use controls such as conservation easements to preserve open space and minimize the impacts of development.

- Promote tree retention and regulate tree clearing in subdivision and commercial developments.
 - Obtain conservation and public access easements to parcels during the subdivision and site plan review process.
- Acquisition
 - Pursue fee simple acquisition, purchase of development rights and easements to protect key resources, especially agricultural land.
 - Develop a Land Acquisition Plan with a prioritized list of parcels for future development.
 - Pursue open space acquisition for the most important ecological habitat, contiguous tracts key linkages, and viewsheds.
 - The Town should continue to seek annual funding for the purchase of conservation lands and easements.
- Education by the Conservation Commission
 - Provide materials on the town website and in printed form on the following topics: water resources; non-point pollution; designation and management of town forest and smaller forested areas; tree retention; septic system maintenance; animal species cards; and habitat pamphlets.
 - Utilize social media to educate town residents and promote the protection of key assets.
 - Collaborate and serve as a resource to town boards and commissions, especially the Planning Board, Zoning Board, Recreation Commission, Board of Selectmen and Budget Committee.
- Historic Resources
 - Continue to protect and enhance historic properties in Litchfield Center, along Route 3A and the Merrimack River.
 - Encourage the protection, enhancement and rehabilitation of significant architectural and historic resources.
 - Promote the donation of easements by historic property owners to the Town or other land management group.

Chapter I: Introduction

Increasing development pressures and land values in New Hampshire, particularly in the southern region, have demonstrated the need for protecting the natural, agricultural, scenic, and historic resources of the entire State and those of each individual municipality. The farms, forests, wetlands, scenic vistas, and historic resources of a community are extremely important to the overall character of the community, the region, and in many instances the State. Realizing that it would not be impossible to save everything, it is important for a community to identify those aspects essential to the character and identity of the Town.

The Town of Litchfield is located in the south-central region of the State, bounded by the Towns of Manchester, Londonderry, Hudson, and Merrimack and approximately 7 miles from Nashua, NH, and about 9 miles south of Manchester, NH, the two largest cities in NH. Litchfield has a strong agricultural heritage with fertile lands located along the banks of the Merrimack River. During the 1990's southern NH experienced a significant period of overall growth, and residential development. Acres of forest, field and farmland continue to be subdivided for residential, commercial, and industrial purposes. Tax map records illustrate the dramatic change in Litchfield. In addition, there is growing concern in the Town and throughout the State for the protection of wetlands, aquifers, rivers, and streams as natural areas and as water resources. This concern led to a USGS aquifer delineation study for the NRPC region (Toppin, K. W. (1987). Funding for the project was a joint effort between the USGS and the localities.

Litchfield is committed to protecting its significant resources as is evidenced by the numerous direct and indirect protection mechanisms already in place: the Conservation Open Space Development, the Aquifer Protection District, the Wetlands Conservation District, and the Floodplain Conservation District all provide protection for the Town's resources. Additionally, Section 403.07 Sewage and Solid Waste Disposal and Section 404.00 Waste Disposal, provide added regulations regarding storage, disposal, treatment and or recycling of waste products and wastewater.

RSA 36-A provides the legislative authority for towns to create conservation commissions and identifies their responsibilities. One of those responsibilities is to "keep an index of all open space and natural, aesthetic or ecological areas within the city or town and scenic resources." In addition, "it shall keep an index of all marshlands, swamps and all other wetlands in a like manner, and may recommend to the city council or selectmen or to the department of natural and cultural resources a program for the protection, development or better utilization of all such areas." This Plan is developed to assist the Conservation Commission in achieving those objectives.

This plan includes high level goals and objectives in Chapter 2, priorities for resource management and recommendations in Chapter 3, with the vast majority of the plan dedicated to the inventory and analysis of the Town's natural, agricultural, scenic and historic resources.

Chapter II: Goals and Objectives

Prior to developing the Conservation Plan, the Conservation Commission established a few overall broad goals for the plan. After completing the inventory of the Town's natural, agricultural, scenic, and historic resources and the identification of the federal, state, and local regulations protecting these resources, the Conservation Commission proceeded to develop measurable objectives for achieving the goals. The goals and objectives established for the Plan are the precursors to the recommended actions to implement the Plan. The following goals and objectives have been established for the Litchfield Conservation Plan.

Goal #1: To preserve the visual character of the Town by protecting its natural, historic, scenic, and agricultural resources.

Objectives:

1. Identify the natural, historic, scenic, and agricultural resources of the Town.
2. Develop a Natural Resource Inventory.
3. Purchase or acquire easements, options, and rights of first refusal for priority areas and parcels.

Goal #2: To promote the conservation, protection, and sound management of the Town's natural resources.

Objectives:

1. Preserve prime agricultural resources and existing farms.
2. Increase protection for wetlands.
3. Protect the shorelines of streams and ponds.
4. Limit future development to sites with suitable soils.
5. Increase protection of public and private water supplies.
6. Reduce non-point sources of pollution.
7. Develop partnerships with land trusts.

Goal #3: To promote the conservation, protection, and sound management of the Town's wildlife and habitat.

Objectives:

1. Maintain a diversity of wildlife habitats to ensure species diversity, including endangered and threatened species as defined by NH Department of Fish and Game.
2. Connect parcels of land to create wildlife corridors as defined by NH Department of Fish and Game as well as travel corridors for people.

Goal #4 Provide a broad range of recreational opportunities for all ages and user groups.

Objectives:

1. Increase awareness of existing facilities.
2. Increase public access to and use of the Town's natural resources.
3. Acquire fee simple rights or easements to additional recreational land.

Goal #5: Protect and preserve the Town's historic resources.

- Objectives:
1. Continue archaeological investigation particularly along the brooks and associated floodplain that feed into the Merrimack River and along 3A
 2. Maintain a historic resources inventory.
 3. Support the protection of the historic Town Center and buildings along Route 3a in conjunction with the Heritage Commission.

Goal #6: Foster strong relationships with property owners and other Conservation Commissions.

- Objectives:
1. Set up individual meetings with property owners of parcels with identified natural, historic, scenic, agricultural, wildlife and habitat areas, to educate them on the responsibilities and goals of the Conservation Commission.
 2. Identify potential opportunities to partner with property owners to preserve key parcels or portions of parcels.
 3. Explore opportunities for future gifting of key parcels as identified in this plan.
 4. Establish relationships with other conservation commissions through the NH Association of Conservation Commissions, attending other town's conservation commission meetings and future regional meetings.

Chapter III: Priorities for Natural Resource Management and Recommendations for Action

The previous sections of the Conservation Plan have focused on identifying the Town's natural, historic, agricultural, and scenic resources and the Federal, State, and local regulations designed to protect those resources. This section of the Plan focuses on evaluating the protection needs of the resources and is designed to assist the Conservation Commission in making decisions and to provide for effective and efficient use of its limited resources.

The Conservation Commission understands it would be impossible to preserve all of the open spaces and resources of the Town. Realizing this, they have tried to identify the most significant assets of the community, those important to maintaining the character of the Town.

1. Conserve Prime Agricultural and Habitat Resources
2. Create Corridors for Wildlife Habitat Protection
3. Preserve Scenic Areas
4. Protect Unique Natural Resources
5. Preserve Key Historic Sites in the Community
6. Preserve the Quality of Surface Waters and Groundwater for the Future

The Town of Litchfield is concerned about its natural resources as is evidenced by the regulations already adopted, the Conservation Open Space Development, the Floodplain Conservation District, the Wetlands Conservation District, the Aquifer Protection District, and the various other direct and indirect protection mechanisms contained in the other sections of the zoning ordinance. The Town's commitment has also been demonstrated by its funding for the development of a Conservation Plan, and on-going updates to the current Master Plan.

In an effort to continue preserving key natural, historic, agricultural and scenic resources, the following recommendations have been identified. These recommendations will assist in achieving the goals and objectives established for the Litchfield Conservation Plan and identify the group(s) responsible for carrying out these actions.

Local Land Use Controls

Zoning is an avenue available to a town for protecting its natural resources. Zoning is a low-cost, effective mechanism for protecting a dispersed resource such as a wetland or a floodplain. The Town of Litchfield has adopted a number of regulations providing direct protection for many of its natural resources while other regulations provide indirect benefits. While the existing regulations provide adequate protection for many of the Town's resources, some minor adjustments to the existing regulations would increase the level of protection afforded to the Town's natural resources. The following recommendations address proposed changes in the Town's zoning ordinances.

1. Encourage the use of innovative land use controls including conservation/open space development, growth boundaries, agricultural zoning, and transfer of development rights are techniques available to preserve open space and minimize the visual impact of new

development on significant historic areas, open space, and scenic views. Natural Resources and Historic Resources Chapter, Master Plan

2. Promote Tree Retention in Subdivisions and Commercial Developments. Regulate tree clearing on new development, to promote retaining undamaged trees or planting new trees as needed. Simply having mature hardwood trees on the south side of a house will reduce the winter heating costs and summer cooling costs by 10%. Leaving trees around residences also reduces the area devoted to lawns, and the impacts of fertilizers, pesticides, and watering. Trees also help residences blend into the landscape. Natural Resources Chapter, Master Plan
3. Educate property owners about the benefits of tree retention. Conservation Commission

Some of the recommendations outlined above require an amendment to the existing Zoning Ordinance or the development of new regulations. To accomplish these recommendations the Conservation Commission should work with the Planning Board to develop the necessary amendments and regulations in a joint effort. In addition to the specific recommendations for changes to the Zoning Ordinance, the following general recommendations are made regarding the powers of development review and to ensure continued monitoring of the impact of growth and development on the natural resources of the community.

1. The Conservation Commission with the assistance of the Planning Board should continually monitor development in the Town. This will allow an analysis of the cumulative impacts of growth and development on water quality and the other natural, historic, scenic, and agricultural resources of the community. Urban development increases the amount of impervious area resulting in increased runoff and an increased potential for flooding and water contamination. In addition, development can reduce the amount of agricultural land remaining in a community and profoundly impact the scenic quality and character of the Town.
2. The Planning Board should continue to use its powers of subdivision review and site plan review to assess the impact of proposed developments and to negotiate design changes with developers that would protect the Town's natural, scenic, historic, and agricultural resources.
3. The Planning Board should negotiate, through the subdivision and site plan review process, to obtain conservation and public access easements to parcels prior to development of a site, upon the request and input of the Conservation Commission. The conservation easements can be used to protect the natural, historic, and scenic resources contained on a site. The public access easement is necessary to allow public use of or passage across a site. This is a particularly important consideration along the Merrimack River for developing the greenbelt and for developing any additional trail systems.
4. Provide Neighborhood Recreation Opportunities – During development review, the Planning Board should promote park dedications and public access to lands adjacent to new development. Examples of needs are open fields, ball fields, picnic tables and trails. Neighborhood-level facilities enhance community development and provide play space close to home or work. These parks should not be substitutes for higher-order town-wide facilities. Community Facilities Chapter, Master Plan

Federal and State Regulations

As indicated in Chapter III, there are numerous state and federal regulations with jurisdiction over local land use activities. It is important that the Town's governing bodies, boards and citizens be aware of these regulations in order to utilize them to their fullest extent and ensure compliance.

1. The Conservation Commission should consider developing a brief description of the state and federal regulations that relate to land use activities. The list should contain the appropriate agency to contact in case of a violation. Citizens should be encouraged to report any suspected violations to the appropriate agency. There are numerous available resources that could be linked to the website.
2. The Conservation Commission should join forces with other commissions and conservation organizations to lobby the legislature to increase the penalties for violations of state environmental laws and strengthen enforcement. Under the existing penalty structure, penalties are often not severe enough to ensure compliance with the law.

Acquisition

While federal, state, and local regulations can be used to provide an adequate level of protection for the majority of the Town's natural resources, there exist some resources where regulation is inadequate or inappropriate. In these instances, acquisition is the most effective mechanism available for ensuring the long-term protection of the resource. Fee simple acquisition of the parcel may not be necessary. The purchase of development rights or easements may be all that is required to protect the resource. Based on this, the following recommendations are made for acquiring easements or fee simple ownership of key parcels in the Town.

1. The Conservation Commission should develop a Land Acquisition Plan with a prioritized list of parcels for future development.
2. Protect Farmland. The Town should evaluate if funds set aside for agricultural lands protection and preservation are comparable to the high priority it is assigned. Officials may want to develop policies to provide additional tax incentives for maintaining large blocks of active agricultural land. Natural Resources Chapter, Master Plan
3. The Town should pursue the purchase of development rights or easements to the most significant agricultural lands in the community. This acquisition is important to assure the continuation of agriculture and to maintain the character of the Town. In addition, the preservation of agricultural lands will generally provide multiple benefits by protecting other resource areas located on the parcel, such as viewsheds and habitats.
4. The Conservation Commission should pursue open space acquisition. Continue to inventory natural systems and identify the most important ecological habitat, contiguous tracts, and key linkages. It is important to emphasize that viewsheds are a natural resource and form an important part of community character; thus, there should also be attention to these resources in long-range environmental planning and during development review. Natural Resources Chapter, Master Plan

5. The Conservation Commission or Town should actively seek funding for the purchase of conservation lands or easements.
6. The Conservation Commission should continue to seek funding, from the Town in the annual budget, for conservation land and easement acquisitions. The information gathered in this plan and any additional available information should be used to support the Conservation Commission's request for funding to the Budget Committee. The Conservation Commission needs to make a strong presentation to the Budget Committee and CIP Committee to obtain their support. In addition, the Conservation Commission needs to continually keep the citizens informed about the increase in growth and land use changes within the Town to gain their support for funding conservation purchases.
7. The Conservation Commission should explore opportunities for potential partnerships with land trusts to purchase and manage key land areas in town. Groups such as Piscatquag Conservancy, Agrarian Trust, the Nature Conservancy, and Society for the Protection of NH Forest should be considered.

Education

Education is important to the success of the Conservation Plan in general and essential to many of the individual components. The Town's citizens need to be aware of the immediate and cumulative impact of their action on the natural, scenic, historic, and agricultural resources of the community. In addition, the town meeting form of government makes it necessary for voters to be informed of resource related issues in order to gain their support of conservation efforts and for approval of regulations designed to protect and conserve the Town's resources. The primary responsibility for conservation education lies with the Conservation Commission. It is their job to see that the community is well informed about the conservation issues of the Town. The following recommendations are made to increase public education activities in the Town, thereby increasing public awareness of conservation issues and public support of conservation efforts.

1. The Conservation Commission should provide materials on the website and in person if opportunities arise, to educate town residents on a variety of topics such as:
 - Protection of water resources and water conservation;
 - Impacts of non-point pollution on water quality and what can be done to decrease non-point pollution on an individual basis;
 - Designation of town forests and management of small forest areas, for such purposes as tree harvesting, wildlife and multiple use;
 - Conservation mechanisms available to private landowners and the benefits of the different alternatives;
 - Benefits of tree retention;
 - The care and maintenance of septic systems.

In conjunction with the Library, Information and speakers on these topics can come from a variety of organizations such as the County Forester, the Natural Resources Conservation

Service, the Society for the Protection of New Hampshire Forests, the Nature Conservancy and the NH Audubon Society, to name only a few.

2. The Conservation Commission should utilize social media to its fullest extent to educate and promote protection of key town assets and lands.
3. Promote programs and organized activities to increase awareness and utilize existing trails, ponds and rivers.
4. The Conservation Commission should acquire and distribute habitat and animal guides from NH Fish and Game. This activity will get people interested in the recreational and conservation activities of the Town and provide additional support to the Conservation Commission.
5. The Conservation Commission should serve as a resource and collaborate with local boards and committees such as the Planning Board, Zoning Board, Recreation Commission and Board of Selectmen, as well as the NH Association of Conservation Commissions and conservation commissions in surrounding towns.
6. The Conservation Commission should maintain relevant materials and resources on the Town website. In addition, the Commission should look for opportunities to educate the public via social media and other media outlets.
7. The Conservation Commission members should establish relationships with other conservation commissions by attending their regularly scheduled meetings, as well as routine regional meetings.
8. Conduct outreach at schools and town events catered to families and children.

Conservation Commissions

As Conservation Commissions evolve and look to the future, there are opportunities to expanding their role beyond the items discussed above. The following is a list of additional efforts that conservation commissions, in the region and beyond, are working on and may be of interest in the Town of Litchfield as well:

- Develop detailed management plans for the most significant properties in town.
- Focus on water quality preservation through coordination with other boards, organizations and state and federal organizations.
- Increase communication between local boards and organizations within the community, region and state.
- Work with town leadership to periodically evaluate the need for additional expertise to assist in the protection and management of the Town's natural resources, such as a licensed forester, soil scientist, land preservation expert, or wetlands scientist. These resources could provide a higher level of expertise and assistance to the town as needed and provide input on government decisions affecting natural resources.

Historical Society and Heritage Commission

The Historical Society and Heritage Commission can provide a great deal of information about the historic resources of the Town. In addition, they are the organizations involved in promoting and protecting the historical resources and heritage sites of the Town. Therefore, the Conservation Commission needs to work jointly with the Historical Society and Heritage Commission to conserve the historic resources of the community. The following are from the HISTORIC RESOURCES CHAPTER of the Master Plan.

1. Encourage continued archaeological investigation in Litchfield, particularly along the brooks and associated floodplain that feed into the Merrimack River, and which have not been studied in detail, as well as along 3A where much of the recent history evolved. One reason that investigation is an important first step is that without it there may be a lack of awareness regarding key resources and sites.
2. Continue to locate, identify, and catalogue sites of historical significance and identify the highest priorities for preservation. Analyze resource types, the significance of sites, the imminence of threats to resources, and the opportunities for preservation. Analyzing resources now could place the community in a competitive position to receive grant funds when these are available.
3. Continue the protection and enhancement of the historic Litchfield center. The residential, agricultural, and public service character should be retained. This area could potentially serve as a boundary or gateway for a town-center or village zoning district to the north and west, which could extend as far as the Liberty Way municipal complex.
4. Obtain copies of documents and studies that identify and assess archeological and historical resources from the New Hampshire Division of Historical Resources. Obtaining this information and making it available to the public at the local level will facilitate the systematic sharing of information on cultural and historical resources.
5. The Town should encourage the protection, enhancement, and rehabilitation of significant architectural and historic resources such as the Town Hall and the library. Any building changes, site improvement or other alteration (especially to town owned buildings) should respect the historical qualities of the structure. Similarly, if renovation is proposed for the fire station on 3A, efforts should occur to improve the façade appearance so the structure better blends in with the historic buildings adjacent to it.
6. Encourage National Register listing for eligible local structures, such as the town center and appropriate private residences.
7. Continue to locate, identify, catalogue, preserve and protect town records, documents, manuscripts, and artifacts and provide a suitable and safe repository for them. Early handwritten records should be reproduced (transcribed or microfilmed but not photocopied) and copies kept in more than one location. Continue to make collected historical information (in a protected environment) accessible to town residents and future generations.
8. Promote the donation of easements by historic property owners to a designated authority such as the Conservation Commission, The Society for the Protection of New England Antiquities, or

an established land trust such as the Society for the Preservation of New Hampshire Forests. Where appropriate, the Town should consider applying for assistance from the Trust for New Hampshire Lands acquisition and easement program.

9. Promote upgrading, preservation and protection of Town graveyards and private burying grounds.

Planning Board & Zoning Board of Appeals

The Planning Board is responsible for drafting new zoning ordinances, amending existing ordinances and, along with the Zoning Board of Adjustment, administering the Town's land use regulations. Many of the recommendations proposed in the Plan require the Planning Board to amend existing or draft new zoning regulations. It is important that the Planning Board understand the reasons for amending the existing and developing new regulations to conserve the Town's natural resources. Therefore, it is recommended that:

1. The development of the amendments and the new ordinances be a joint effort between the Planning Board and the Conservation Commission.
2. The Planning Board publicly support the recommendations of this Plan and the conservation efforts of the Conservation Commission.
3. The Planning Board use this Plan to develop the Natural Resources chapter of the Town's Master Plan.
4. The Planning Board support providing funding to the Conservation Commission for the purchase of conservation areas in the annual Town budget.

Board of Selectmen

The Board of Selectmen is the decision-making body for the Town. Therefore, it is important to have the Board's support for the Conservation Plan and the efforts of the Conservation Commission. Most of the existing State and Federal conservation programs and funding sources require the signature and support of the Board as the Town's representatives. Therefore, it is important that the Conservation Commission develop a strong working relationship with the Selectmen to ensure cooperation in obtaining conservation areas and the timely conveyance of information concerning conservation efforts.

Budget Committee

The Town budget is prepared by the Budget Committee. Therefore, it is essential that the Conservation Commission educate the Budget Committee concerning the need for conservation of the Town's natural resources to obtain funding for their efforts.

Natural Resource Conservation Service (NRCS)

The NRCS can provide the Conservation Commission with the following assistance: evaluating impacts to wetlands; conduct site visits to evaluate wetlands and soils characteristics; provide general educational information concerning soil capabilities and agricultural practices; numerous other types of assistance and information. The NRCS is also a good source of speakers and information for the Town discussions and the information pamphlets.

Private Conservation Organizations

There are several private conservation organizations active in New Hampshire. These include the Society for the Protection of NH Forests, the Audubon Society, the New England Forestry Foundation, the Society for the Protection of New Hampshire Forest, the Nature Conservancy, the Russell Farm and Forest Conservation Foundation. All these organizations are actively involved in obtaining conservation lands and easements.

Cooperative Extension

The NH Cooperative Extension is another agency from which the Conservation Commission can obtain resource information. The Extension can assist the Conservation Commission by providing information and speakers for the Town discussions and the information pamphlets.

Nashua Regional Planning Commission (NRPC)

The NRPC can assist the Conservation Commission and the Town with numerous activities. NRPC staff can provide expert advice on developing regulations for protecting the Town's resources since the NRPC has extensive experience in developing ordinances. In addition, NRPC staff can assist the Conservation Commission with applications for funding and in conducting an inventory of its historical resources.

Lower Merrimack River Local Advisory Committee (LMRLAC)

The Merrimack River has been designated as a protected river due to its outstanding natural and cultural resources. The LMRLAC formed in 1990 after the Lower Merrimack received designated status. Under RSA 483 Local River Management Advisory Committees are appointed for each designated river or segment. Activities of the Committees vary from reviewing wetland applications and site plans for development, to assisting with trail projects and commenting on conservation activities within the river corridor.

New Hampshire Office of Planning and Development (NH OSI - formerly NH Office of Strategic Initiatives)

The NH Office of Planning and Development maintains a significant on-line resource library with a vast array of topics that could be an excellent reference for the Conservation Commission.

Chapter IV: Inventory, Analysis, And Tools to Conserve, Protect and Enhance Litchfield's Resources

A. Water Resources

Rivers and Streams

The Merrimack River, the most prominent water body in the area, runs 7.9 miles along the western edge of Litchfield and covers 243 acres of Town. Overall, the Merrimack River watershed, which is that portion of the land area contributing runoff to a surface water body, covers more than 5,000 square miles in New England and is a major watershed in New Hampshire. The four main brooks that run east to west and connect wetlands are also defining features of the community.

The *Litchfield Water Resources Management and Protection Plan* by the Planning Board in 1990 presents comprehensive descriptions of local waters. In addition to the nearly eight miles of Merrimack River Shoreline, there are 104,700 linear feet, or nearly 20 miles, of perennial and intermittent streams. The major perennial streams are: Nesenkeag Brook, Chase Brook, Colby Brook, and Watts Brook.

Table 3 - 1: Perennial Streams in Litchfield

Stream Name	Total Miles	Miles in Litchfield	% of total in Litchfield
Nesenkeag Brook	4.7	3.7	79%
Chase Brook	5.7	3.4	60%
Colby Brook	1.5	1.5	100%
Watts Brook	2.1	.4	20%

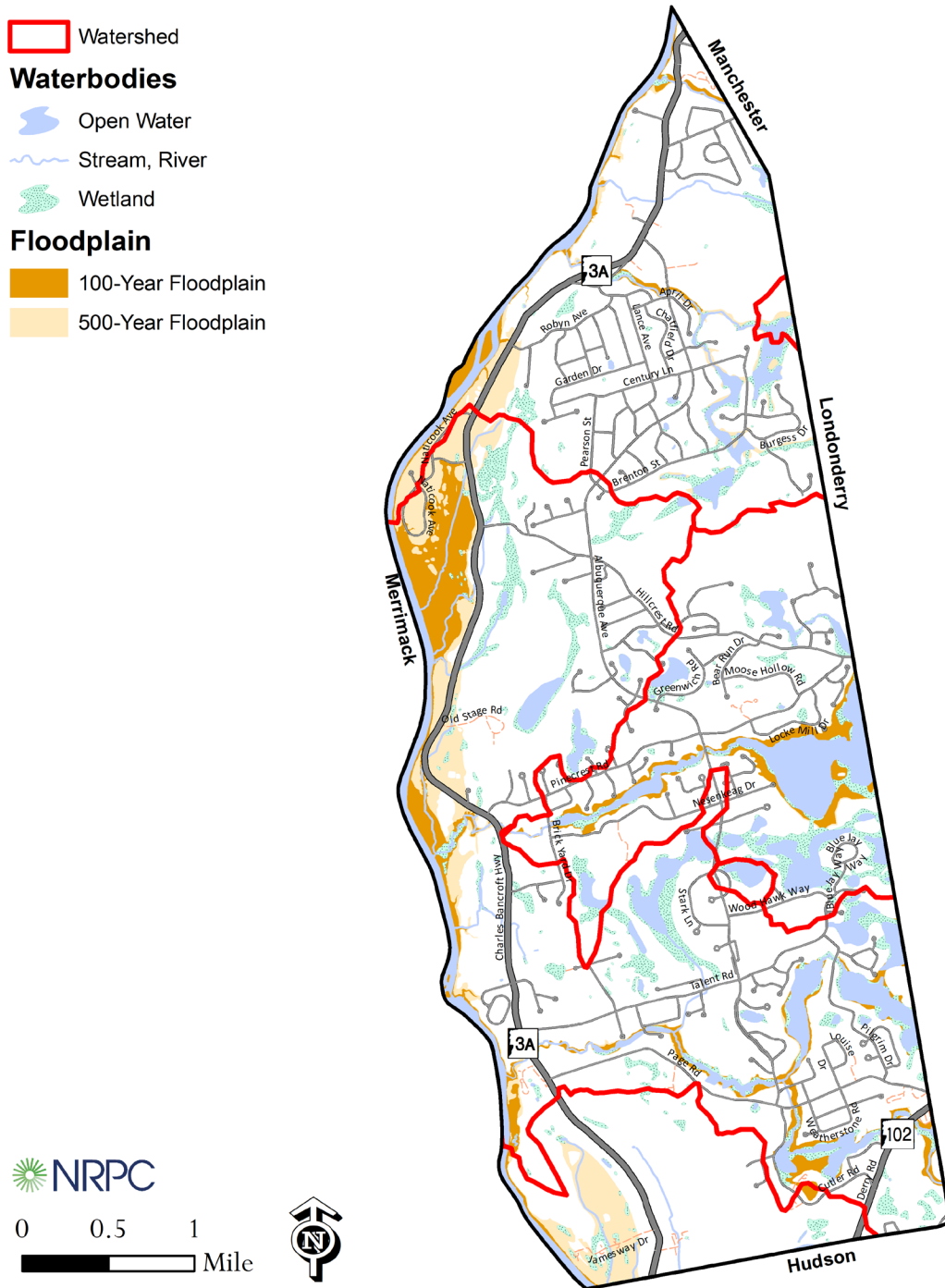
Lakes and ponds

Litchfield contains several small ponds, the most prominent of which is Darrah Pond.

Table 3 - 2: Ponds in Litchfield

Pond Name	Pond Size	Comments
Darrah Pond	12.5 Acres Max Depth: 8.4m Water Clarity: 3.6m	The only pond in Litchfield with a Lake Trophic Data report from the NHDES. Noted in the 2001 report was reduced water quality due to drawdown of pond as a result of the lowered water table.
Common Pond	6 acres	
Duck Pond	6 acres	
Half Moon Pond	6 acres	
Perch Pond	4 acres	
Rocky Hill Pond	3 acres	

Map 3 - 1: Surface Water Resources and Floodplain



Data

Sources: Watersheds: NH Department of Environmental Services AUID Catchments 2017; Open Water, Streams, Rivers: National Hydrologic Dataset (NHD); Wetlands: National Wetland Inventory (NWI Plus); Floodplains: FEMA DFIRM for Hillsborough Co.

Watersheds

A discussion of rivers and streams is not complete without considering the watershed areas that drain into the watercourses and waterbodies. A watershed is defined as the land area that drains into a watercourse or waterbody. These pathways can be underground or on the surface and they typically become progressively larger as the water moves downstream. Watersheds vary in size and every stream, tributary, and river has an associated watershed (size depicted in **Table 3 - 3**). Small watersheds join to become larger watersheds. Most of the waters in Litchfield are part of the greater Merrimack River watershed.

The size and interjurisdictional nature of watersheds make them difficult to manage. Because watersheds are not constrained by municipal boundaries, it is important for Litchfield to develop a strong working relationship with its neighboring towns. It is essential to evaluate the impact of the proposal on the waterbody into which it drains and to assess the cumulative impact of development within the watershed. Consideration should be given to increases in impervious area, alteration of natural drainage patterns, increases in quantity and velocity of runoff and potential for erosion and sedimentation.

The Merrimack River, the most prominent water body in the area, runs 7.9 miles along the western edge of Litchfield and covers 243 acres of Town. Overall, the Merrimack River watershed, which is that portion of the land area contributing runoff to a surface water body, covers more than 5,000 square miles in New England and is a major watershed in New Hampshire. The four main brooks that run east to west and connect wetlands are also defining features of the community. There are five main watersheds in Litchfield. **Map 3 - 1: Surface Water Resources and Floodplain** shows the boundaries between local watersheds. All local watersheds drain into the Merrimack River. Two areas adjacent to the river, covering approximately 4,500 acres (half of Town) drain directly into the river without entering another brook or stream. Other minor watersheds within Litchfield are Chase Brook, Nesenkeag Brook, Colby Brook, and Watts Brook.

Table 3 - 3: Minor Watersheds in Litchfield

Minor Watershed name	Acres in Litchfield	% of watershed in Litchfield
Chase Brook	1573	27%
Nesenkeag Brook	2147	36%
Colby Brook	1010	64%
Watts Brook	107	4%

Surface Water Quality

In recent years the New Hampshire Department of Environmental Services (NH DES) has conducted surface water quality testing of some prominent waterbodies in Litchfield using their Watershed Assessment Summary Reports. These reports cover water quality issues such as harmful bacteria, levels of dissolved oxygen and phosphorus, and if the waterbody could be used safely as a potential drinking source. Below are summaries of the report cards for each prominent waterbody in Litchfield. Nearly all the waterbodies in the reports were found be good for potential drinking water supply and carried general advisories concerning fish consumption due to mercury. This advisory is fairly standard across

the state and urges wild fish consumption to be limited by those who are sensitive to mercury poisoning.

Merrimack River – Aquatic life integrity poor due to PH (2016) and likely bad scores for phosphorus (2016) and invasive species, despite likely good scores for chloride, dissolved oxygen, and turbidity. Good score for Potential drinking water supply even with likely bad scores of E.COLI (2019) and Fecal Coliform(2016). Poor for Primary Contact Recreation for Creosote (2013) and E.COLI (2019). Good score for secondary contact recreation.

Nesenkeag Brook – Severe quality regarding aquatic life integrity – dissolved oxygen and PH (2004)

Darrah Pond –received severe score for Aquatic Life integrity for PH(2002) Phosphorus (2004) and Chlorophyll-a (2004), Poor to Likely bad scores for potential drinking water supply and primary contact recreation for E.COLI(2018) and Cyanobacteria(2018).

Colby Brook – Likely good score for Aquatic Life Integrity (2018) with same scores for Chloride, Dissolved Oxygen, Lead, PH, Phosphorus, and turbidity. Marginal score for Fishes bioassessments, and likely bad scores for aluminum and benthic-macroinvertebrate bioassessments. Also had likely bad score for E.Coli (2018) for potential drinking water supply and primary contact recreation.

Watts Brook – Likely bad score for aquatic life integrity – likely bad aluminum and phosphorus (2018). Also likely bad levels of E.Coli(2018) for potential drinking water supply, primary contact recreation and secondary contact recreation.

Chase Brook – only thing recorded was the mercury fish consumption advisory.

Half Moon Pond - only thing recorded was the mercury fish consumption advisory.

The full watershed assessment summary reports can be found on the NH DES website.

[Lower Merrimack River Local Advisory Committee \(LMRLAC\)](#)

In addition to the Planning Board and Conservation Commission, the Lower Merrimack River Local Advisory Committee (LMRLAC) has been working to monitor and protect Merrimack River shoreline. The LMRLAC is comprised of residents of Litchfield, Merrimack, Hudson, and Nashua. Once one of the ten dirtiest rivers in the Country, significant improvements in water quality have resulted in increased development pressure along the shoreline. The Merrimack River is the most significant surface water resource in the region and recreational use of the river has increased significantly.

There have been local attempts to acquire conservation easements along the river through the development review process and the Town has acquired some significant riverfront parcels in the past. Riparian forest buffers the tree-lined areas along streams and rivers provide a critical role in the protection and enhancement of water resources. The USDA (1997) describes streamside forests as:

“...Extremely complex ecosystems that help provide optimum food and habitat for stream communities as well as being useful in mitigating or controlling nonpoint source pollution. “

Forests along streams host species important to the stream biome, moderate against an adverse influence of light and temperature change, as well as help prevent topsoil erosion. To guard against

uncoordinated, unplanned, and piecemeal development along shorelines in New Hampshire, the Comprehensive Shoreland Protection Act (CSPA) was implemented in July 1994. In 1997, the part of the Merrimack River passing through Litchfield was included as subject to the protection provided by the CSPA. Generally, the CSPA standards are designed to minimize shoreland disturbance to protect public waters, while still accommodating reasonable levels of development in the protected areas.

RSA 483-B became fully effective on July 1, 1994 and sets minimum standards to protect and conserve public water bodies in the State. These are natural ponds or artificial impoundments of ten acres or larger and fourth order or higher rivers. The Act states in Section V(a)(1):

“Where existing, a natural woodland buffer shall be maintained within 150 feet of the reference line. The purpose of this buffer shall be to protect the quality of public waters by minimizing erosion, preventing siltation and turbidity, stabilizing soils, preventing excess nutrients and chemical pollution, maintaining natural water temperatures, maintaining a healthy tree canopy and understory, preserving fish and wildlife, and respecting the overall natural condition of the protected shoreland.”

Refer to the complete Revised Statute Annotated (RSA) 483-B to understand the full details of this law, such as directions for the use of fertilizers and the placement of structures.

In 2008, NRPC and LMRLAC updated the [Lower Merrimack River Watershed Management Plan](#). Local involvement of the LMRLAC was crucial in order to develop a Management Plan that is consistent with the goals of each community in the Corridor and that provides a comprehensive action plan for the long-term management and protection of the Lower Merrimack River Watershed. An important part of the planning process involved a series of four river tours to identify areas of concern in each of the corridor communities.

In 2012, the NRPC conducted the [Lower Merrimack River Continuity Assessment](#) to determine the level of aquatic habitat fragmentation resulting from bridges and culverts, to identify and prioritize the specific stream crossings that can be targeted for improvement, and to provide guidance on the long-term ability of the river's culverts to handle flow and sediment transport processes and their risk of failure.

Any projects that need an Alteration of Terrain permit from DES must be brought to LMRLAC for their comments. Any local, state, or federal activities within a quarter mile on either side of the river should be reviewed by LMRLAC (more info here: https://www4.des.state.nh.us/blogs/rivers/?page_id=87). An update to the Lower Merrimack River Watershed Management Plan is in progress at NRPC and should be finished in 2022.

Wetlands

Wetlands are defined as areas with soils identified as poorly or very poorly drained. Based on the Soil Survey Geographic database (SSURGO) there are approximately 2247 acres of poor or very poorly drained soil in Litchfield. This represents about 23% of the total 9,792 acres covered by the town. Poorly drained soils are shown on **Map 3 - 3**.

Wetlands perform many important functions such as aquifer recharge, flood control, erosion control, water purification, nursery areas and wildlife habitat. Additionally, a number of endangered and threatened plant species are only found in wetlands. Once thought of as wastelands and areas to be filled, the important role that wetlands play in the hydrologic and ecologic health of an area is now

recognized. These areas need to be protected from encroaching development and fill so that they may continue to perform their hydrologic and ecologic functions.

Wetlands are widely distributed throughout Town but are concentrated in the lower-elevation southern and eastern parts of Litchfield. Local wetlands are also located in stream corridors and small, isolated wetlands and bogs. The Litchfield Zoning Ordinance defines wetlands based on soil type such as the presence of poorly or very poorly drained soils and upon the presence of hydric plant species.

Table 3 - 4: Wetland Soils, Litchfield, New Hampshire

Symbol	Soil Map Unit
Poorly Drained	
Bg	Binghamville silt loam
LeA	Leicester-Variant loam
LsA	Leicester-Variant stony loam
LtA	Leicester-Walpole complex, 0-3% slope
LtB	Leicester-Walpole complex, 3-8% slope
LvA	Leicester-Walpole complex stony, 0-3% slope
LvB	Leicester-Walpole complex stony, 3-8% slope
PiA	Pipestone loamy sand, 0-3% slope
RbA	Ridgebury loam, 0-8% slope
ReA	Ridgebury stony loam, 0-3% slope
ReB	Ridgebury stony loam, 3-8% slope
Rp	Rippowam fine sandy loam
Sn	Saugatuck loamy sand
Very Poorly Drained	
BoA	Borohemists, nearly level
Cu	Chocorua mucky peat
Gw	Greenwood mucky peat
Sm	Saco Variant silt loam
So	Scarboro mucky loamy sand
Sr	Scarboro stony mucky loamy sand

Source: US Department of Agriculture, Soil Conservation Service, *Soil Survey of Hillsborough County New Hampshire, Eastern Part, 1981.*

Wetlands Conservation

The Litchfield Conservation Commission has been actively categorizing wetlands in Town according to the NH Method. The information collected describes the current condition and functions of many of the larger wetlands. Such an inventory may be used to:

- Designate significant wetlands as ‘prime wetlands’.
- Show how natural hydrological systems flow, or operate, compared with proposed development(s).
- Develop indexes, or baseline information, on current wetland conditions that could be used as the basis for developing indicators that would be monitored over time to define the relative health of wetlands or used to identify potential wetland protection policy designs.

- For educational purposes by local students, educators, or scientists.

The wetlands inventory is an important reference document and building block to understand more fully, how wetlands function in the community. The study does not involve an inventory of many smaller wetlands, vernal pools, and intermittent streams due to resource and time limitations. Furthermore, the methodology does not provide overall scores or automatic ratings that would identify the most important wetlands. A prime wetlands designation would provide these areas with greater protection at the State level and will increase scrutiny of projects adjacent to these areas. Utilizing this approach, the highest order or most ecologically significant wetlands can be afforded more protection.

The Wetland Conservation District permits the following activities in wetlands: forestry/tree farming; agriculture; wells and well lines; wildlife refuges; parks and recreation uses suitable in wetlands; conservation areas and nature trails; open space and minimal impact crossings for roads and driveways. In addition, wetland areas cannot be used to satisfy minimum lot size requirements. Septic tanks and leach fields must be set back 100 feet from the edge of the wetland and no structures can be erected within 75 feet from the edge of a wetland. A 50 foot naturally vegetated buffer and 200 foot buffer for vernal pools. When human activities are proposed that could adversely impact wetlands, these must be carried out with Best Management Practices, BMPs. For definitions and the complete Wetlands Conservation District ordinance language, refer to the Town of Litchfield, NH Zoning Ordinance.

With regard to wetland regulations, the Conservation Commission and the Planning Board should work together to evaluate existing rules and procedures and make recommendations for upgrades to improve the effectiveness and efficiency of the regulations. One recommended change would be to require maintenance of a natural vegetative buffer within 50 to 100 feet of all wetlands. The advantage of increasing the buffer is that vegetated buffers help decrease nonpoint source pollution by stabilizing soil and preventing erosion. Vegetative buffers also help decrease the velocity of runoff by physical means and remove excess nutrients and other contaminants by physical, biological, and chemical means contained in runoff from roads, residential, agricultural and commercial sources.

Reviews of stormwater drainage system designs and road layouts in subdivisions, and examination of proposed development versus wetlands environmental impacts in site planning, should focus on preserving adequate buffers and ensuring that the potential impacts are not too concentrated in specific locations. If there are ecological impact concerns associated with a development, there are numerous habitat-based methods for impact assessment and prediction that the Board could require project proponents to carry out to inform the Board. Similarly, there are an increasing number of environmental technologies that can help prevent and mitigate potential problems. Standard forms and procedures could be developed for use by the Board to evaluate potential impacts and design options.

Table 3 - 5: Summary of NRPC Region Wetland Ordinance Provision

Town	Wetland District Definition	Wetland Buffers/setbacks
Amherst	Poorly and very poorly drained soils, water bodies.	Septic tanks and leachfields: 75 feet No structures within 50 feet.
Brookline	Poorly and very poorly drained soils, water bodies.	All wetlands: 50 feet Septic tanks and leachfields: 75 feet except raid and very permeability-125 feet No new structures within 25 feet.
Hollis	Poorly and very poorly drained soils, water bodies.	Septic tanks and leachfields: 100 feet No new structures within 100 feet.
Hudson	3-fold definition: wetland soils (very poorly and poorly drained), wetland vegetation, wetland hydrology.	No new structures or parking lots within 25 feet. Septic tanks and leachfields: 25 – 75 feet depending on soils.
Lyndeborough	Poorly and very poorly drained soils, water bodies.	No buffers
Litchfield	3-fold definition: wetland soils (very poorly and poorly drained), wetland vegetation, wetland hydrology	Septic tanks and leachfields: 100 feet No new structures within 75 feet. Basin marshes, bogs, fens, and vernal pools: 200 feet
Merrimack	Poorly and very poorly drained soils, water bodies.	Septic tanks and leachfields: 75 feet No new structures within 40 feet.
Milford	3-fold definition: wetland soils (very poorly and poorly drained), wetland vegetation, wetland hydrology.	All wetlands: 25 feet Designated streams and wetlands: 50 feet No new structures within 50 feet.
Mont Vernon	Poorly and very poorly drained soils, water bodies	All wetlands except vernal pools: 25 feet
Nashua	3-fold definition: wetland soils (very poorly and poorly drained), wetland vegetation, wetland hydrology.	75 on prime 40 on critical
Pelham	Wetland soils and vegetation.	Septic and leachfields: 25 – 75 feet depending on soils.
Wilton	3-fold definition: wetland soils (very poorly and poorly drained), wetland vegetation, wetland hydrology.	No buffers

Floodplains

Floodplains are areas adjacent to watercourses and water bodies, which are susceptible to the natural phenomenon of flooding during periods of high run-off. The unpredictable nature of flooding requires the application of precautionary measures to avoid substantial damage to life and property in areas susceptible to floods.

Two methods are available to avoid the problems presented by periodic flooding. Protective measures can be applied to structures already located, or proposed for location, on floodplain areas. Preventive measures can also be used to regulate the types of development permitted in these areas to minimize the potential hazards to life and property of community residents and landowners. To employ either approach requires the identification of affected properties.

Floodplain areas cover over 1,396 acres or approximately 14.25% of the area in Town. Most of the floodplain area is located along the east bank of the Merrimack River and in the Second Brook and Ottarnic Pond Watersheds as indicated on **Map 3 - 1**. The only way to change the floodplain boundary is for the owner or the Town to submit a Letter of Map Revision and proof to the Federal Emergency Management Agency (FEMA) stating that the designated area is no longer subject to flooding, although it may have been at one time.

The Town of Litchfield requires a floodplain permit for all proposed developments in any special flood hazard areas. The special flood hazard areas are determined by the various zones within the 100-year flood elevation as defined in the Community's Flood Insurance Study, the Federal Insurance Rate Map, and the Flood Hazard Boundary Map.

National Geodetic Vertical Datum

The Litchfield Floodplains Conservation District requires all proposed development in any special flood hazard area to obtain a permit. The Code Enforcement Officer shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding. Any applicant also needs to provide the following:

1. The as-built elevation (in relation to National Geodetic Vertical Datum (NGVD) of the lowest floor (including the basement) and include whether or not the structure contains a basement;
2. If the structure has been flood-proofed, the as-built elevation (in relation to NGVD) to which the structure was flood-proofed; and
3. Any certification of flood-proofing.

B. Soils and Groundwater

Soils are a principal determinant of land development capability, particularly in areas that rely on subsurface waste disposal (septic systems). Depth to water table and bedrock, susceptibility to flooding, slope and permeability are factors affecting the suitability of sites for roads, buildings, septic systems, and wells. Often there are high water tables in Litchfield; many parts of Town demonstrate soils with close (five feet or less) proximity to seasonal high-water tables. Wet soils are important links to the larger hydrogeologic systems influence and influence the ability to build on land. Noteworthy concentrations of fertile soils occur along the Merrimack River -- these prime agricultural soils represent a significant natural resource to both the community and region, which should be preserved from future development.

The USDA Soil Conservation Service (SCS), now known as the Natural Resources Conservation Service (NRCS), conducted extensive analyses of soil conditions in Hillsborough County in the 1970s. The *Soil Survey of Hillsborough County, New Hampshire, Eastern Part* (1981) delineates soil boundaries in Litchfield and describes the characteristics of individual soil types. Each soil is evaluated and rated with

regard to development potential for specific uses such as crops and pasture, forestry, recreation, wildlife habitat, building site development and the location of sanitary (septic) facilities.

The soil survey maps are at a scale of 1:20,000, with the smallest units mapped at 3 acres. This information is not accurate below a gross scale. It is likely that a map unit may consist of more than one soil type when examining an actual location. The name and symbol for each unit is based on the dominant soil type in an area. Because of these limitations, the information provided in the *Soil Survey* is most useful for general planning like this Master Plan. It is recommended to require more accurate and precise on-site soil evaluations, such as site-specific soil mapping, during subdivision and site planning to ascertain the suitability of the soils at a specific site for a proposed use.

Generally, Litchfield soils are sands and gravel at a variety of grain sizes, in slight to moderate slopes, and containing varying degrees of humic (decayed vegetative) materials. The majority of lands are stratified drift deposits, such as fine-grained glacial sediments and more stony soils, which are by-products of the ice age. The *General Soil Map* (SCS, 1981, Page 152) aggregates the majority of soils in the 'Hinckley-Windsor' group, "...deep, nearly level to steep, excessively drained, gravelly and sandy soils; on terraces." Hinckley soils are a major source of gravel and Windsors are a good source of sand. It is the very fine sandy alluvial soils on the Merrimack River banks that are renowned as the finest 'prime' agricultural soils in New Hampshire. The most common soils series are depicted in **Map 3 - 2**.

The most common soil, covering over 4,050 acres, is Windsor loamy sands (41 percent of land surface). Windsor soils are rapidly permeable and excessively drained. As defined by SCS, these soils demonstrate slight to moderate limitations for siting septic systems; especially when situated within steeper slopes. The highest concentrations of Windsors are north of Hillcrest Road and east of Albuquerque Avenue.

Windsor and Hinckley soils demonstrate an average depth to seasonal high water table of five feet. This relatively thin cover, combined with rapid permeability, means that there is not a high degree of natural treatment before contaminant-laden stormwater would percolate into groundwater. Similarly, if septic systems are improperly constructed or maintained, there is a potential for human waste to enter groundwater supplies. In sandy areas if soils are excavated too close to groundwater, the remaining permeable soils may not adequately protect groundwater supplies. The permitting of gravel excavations (RSA 155-E) provides the Planning Board with ample opportunity to protect the groundwater under such sites. Other alternatives to protect soil and groundwater resources are:

- Education on proper septic system Operation and Maintenance (O&M);
- Implementing aquifer and wellhead protection measures;
- Groundwater-monitoring initiatives; and
- Zoning and building code enforcement to promote resolution of problems and pollution prevention;
- Promoting development on other than agricultural and wetland soils.

The other prevalent soils are different wetland soils caused by the high water table. Most common at 1,172 acres (12 percent of the land surface) are Piperstone loamy sand. Other prevalent wet soils are deep muck and seasonally wet Deerfield sands.

Soil Suitability for Septic Systems

Since the entire Town is served by septic systems, the septic tank absorption field category in the SCS Manual is significant for Litchfield. The characteristics of reference soils for the septic system absorption field include:

- The area is located on a gently sloping area of five percent slope;
- The depth to the high water table and bedrock is greater than ten feet;
- The area is not subject to flooding;
- There are less than three percent surface stones; and
- The soil has a percolation rate of twelve to fifteen minutes per inch.

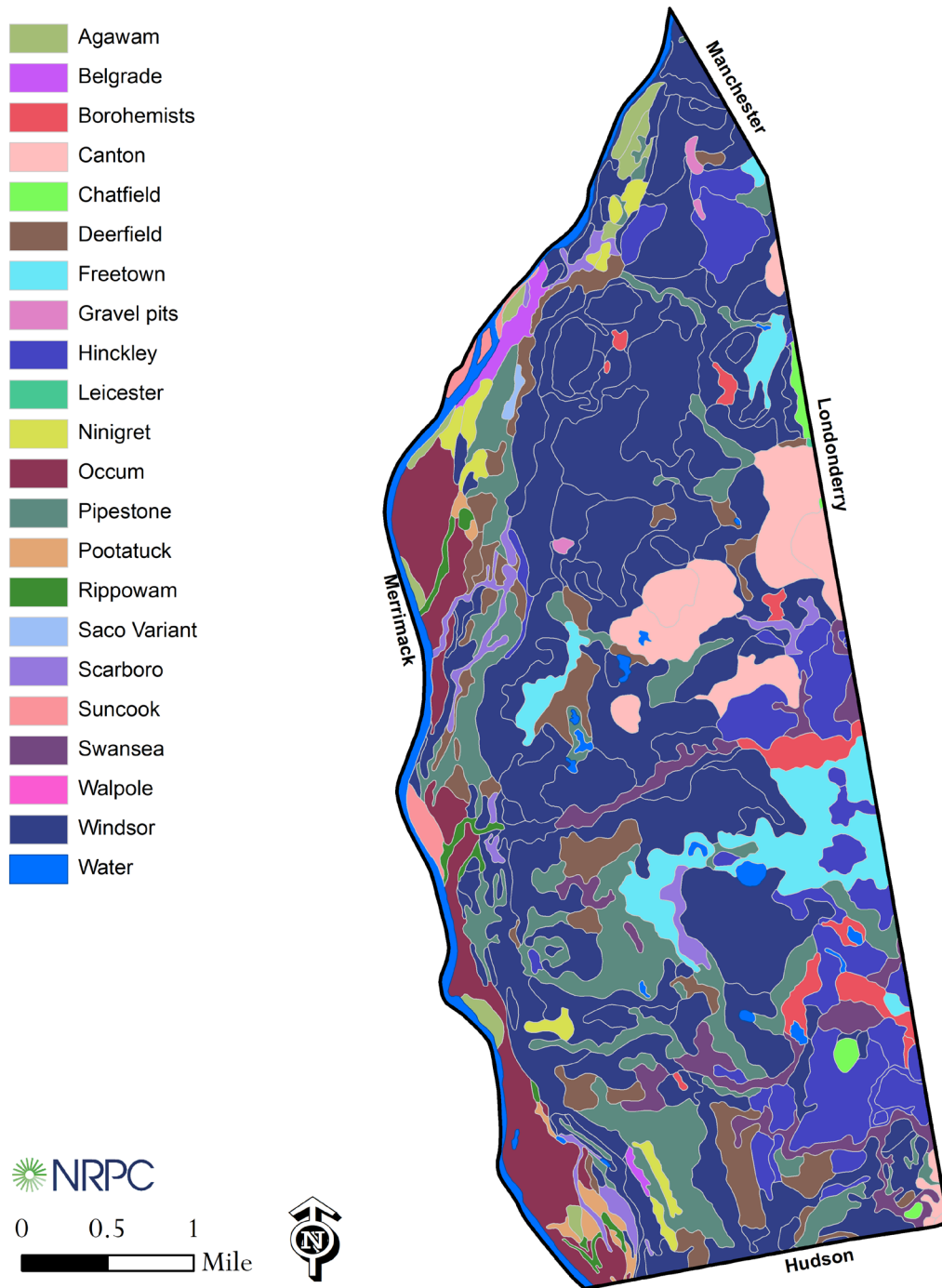
Map 3 - 3 illustrates the estimated 2,247 acres, or 23 percent of Town, covered with wetland soils with low or very low potential for septic absorption fields based on these criteria. Many of the most poorly drained soils are located north of Page Road and south of Pinecrest Road. The incapacity of Hinkley and Windsor soils to hold moisture is an attribute that may make it difficult to contain wastes within the confines of septic system leach fields before effective treatment is completed. The Master Plan warned that soils present a significant obstacle to development. Specifically, it identified potential for some prevalent soils to percolate too rapidly to effectively treat sewage effluent. It cautioned that a 75-foot septic setback from wells and wetlands might not be adequate for public health protection. In the 1997, the septic system setback from delineated wetlands has been enlarged to 100 feet and a 75-foot well radius remains in effect. It is recommended to also extend the well protection radius to 100 feet in order to promote adequate separation of wells and sanitary waste disposal and promote public health. The Town should continue to monitor whether any incidences of groundwater problems occur within these soil series. Some other mechanisms that the local public sector could consider utilizing to aid the evaluation of groundwater quality are, monitoring wells and voluntary septic inspections.

Site Specific Soil Mapping Standards

The Society of Soil Scientists of Northern New England (SSSNE) recently adopted the 'Site Specific Soil Mapping Standard for New Hampshire and Vermont'. The standard classifies soils to the series level, consistent with maps found in the *Soil Survey*. The new standards replace the High Intensity Soil Survey (HISS) method used in many communities to determine site suitability. In 2000, the Planning Board amended the subdivision and site plan regulations to require the use of Site Specific Soil Standards for future development applications.

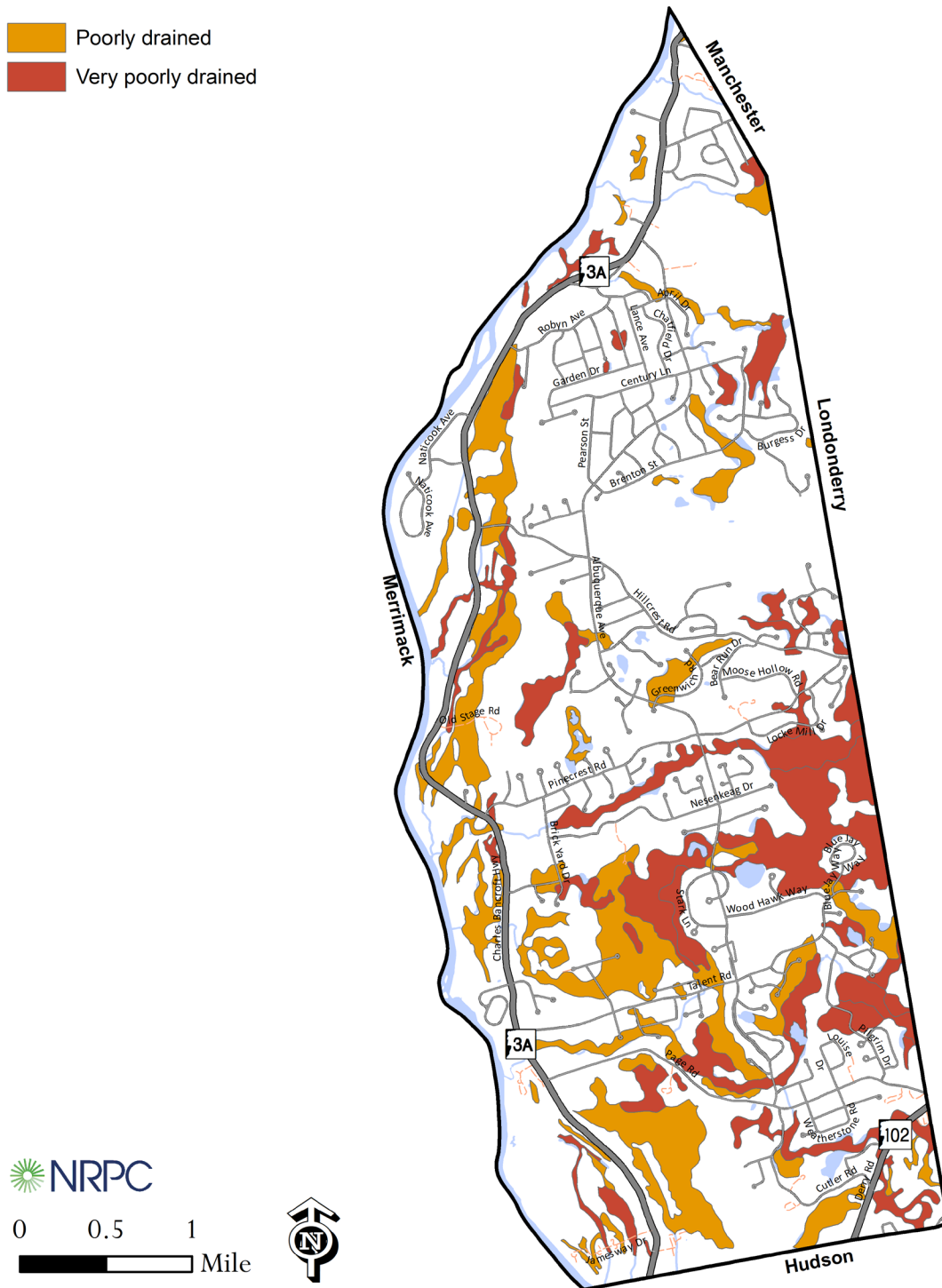
This subsection has provided a general discussion of Litchfield soil resources. Most biological activity, as well as high levels of nutrients and organic matter, occurs in the top few inches of soil. The application of appropriate building development practices will help promote soil conservation and biological diversity as well as other benefits such as erosion control and the protection of local water quality.

Map 3 - 2: Soils by Type



Data Source: 2020 SSURGO database.

Map 3 - 3: Soils by Drainage Class



Data Source: 2020 SSURGO database.

Aquifers

In addition to surface water, groundwater is the other major source of water supply. Groundwater is an abundant and ubiquitous natural resource in Litchfield.

Stratified drift aquifers are composed of sand and gravel deposited by the melting of glacial ice. These deposits may be quite extensive, layered or "stratified" and coarse in texture. This coarse texture allows for the storage of large volumes of water and the high porosity allows groundwater to flow through quite readily. Because of their potential to yield large volumes of water, stratified drift aquifers are considered prime sources of water for municipalities or other large volume users.

Stratified drift aquifers with potential to yield water underlay 94 percent of the Town - Litchfield ranks among the top three municipalities in the State in terms of the amount of area underlain by stratified drift aquifers that possess some ability to store and transmit volumes of water. Many of these locations have an ability to store and transmit large volumes of water. This section describes the location and characteristics of hydrogeological features and protection of replenishable - but also depletable - groundwater resources.

The United States Geological Survey (USGS) recently conducted a survey of stratified drift aquifers in the NRPC region. **Map 3 - 4** delineates the aquifer based on transmissivity and material composition. Transmissivity is the capacity of the aquifer to transmit water measured in feet squared per day. Aquifers are classified in four basic types based on material composition. Material composition is directly related to the storage capacity and transmissivity of the aquifer, for example coarse grained stratified drift is more porous than fine grained stratified drift and therefore it has a greater capacity to store and transmit water.

Aquifers are highly susceptible to pollution due to the ease and speed with which water-borne pollutants are transmitted through the soil. Insecticides, septic tank effluent, leaking underground storage tanks, landfill leachate or improperly stored hazardous wastes are potential sources of aquifer pollution. In addition, development which involves extensive amounts of impervious material cover (e.g. asphalt or cement) can reduce the productivity of aquifer areas. Extensive sand and gravel excavations can also have a negative impact on aquifers and removal of too much material increases the likelihood of contamination. Decreasing the amount of material overlaying the aquifer increases the potential for the contaminant to infiltrate into the aquifer at an increased rate and at an increased concentration.

As depicted on **Map 3 - 4**, approximately 14.1 square miles of stratified-drift aquifers exist in Litchfield scattered throughout Town and varying in saturated thickness and transmissivity. There are cross-sections of saturated soils more than 100 feet deep in Litchfield. One location of aquifers with zones of transmissivity greater than 2,000 feet squared per day is in the north of Town by the Manchester border extending south into the commercial zoning districts by Colby and Roberts Roads. Another area of high transmissivity is in the southeast part of Town by Albuquerque Avenue and Talent Road. In some cases, the transmissivity of the aquifers exceeds 8,000 feet squared per day. Because of their ability to store and transmit large volumes of water, these stratified drift aquifers are important sources of future water supply for residences and businesses within the Town as well as in the larger region.

The USGS study by Topin titled *Hydrogeology of Stratified Drift Aquifers and Water Quality in the Nashua Regional Planning Commission Area, South-Central New Hampshire*, describes the stratified drift aquifers in Litchfield:

Located on the eastern side of the Merrimack River, the predominant stratified material (in Litchfield) is fine-grained glacial sediment of Glacial Lake Merrimack (Koteff, 1976). Several good aquifers, in northern and central Litchfield are permeable, coarse sand gravel with a saturated thickness greater than 100 ft in some places.

Large quantities of water are pumped from the coarse-grained sand and gravel aquifer centered about Darrah Pond. This aquifer is in a segment of a buried valley occupied by Darrah Pond delta deposits (Koteff, 1976); the deposits are more than 100 ft thick southeast of Darrah Pond, and their transmissivity is greater than 8,000 ft²/d. The coarse-grained of the aquifer are bounded on the west by fine-grained materials. The Darrah Pond well (w-59) has a capacity of 100 gal/min and serves part of central Litchfield. Darrah Pond is the only significant source of water available for induced infiltration into this area.

Northwest of Darrah Pond, two wells (W-56, W-57) are located in the coarse-grained sand and gravel along Nesenkeag Brook, and each yield less than 100 gal/min. The aquifer along the brook is not as extensive as the Darrah Pond aquifer; its saturated thickness is less than 40 ft, and transmissivity is less than 8,000 ft²/d.

South of the Darrah Pond aquifer, another coarse sand and gravel aquifer, located near Cutler Road, also is within the same buried valley that follows a north-south course through central Litchfield. The saturated thickness is greater than 60 feet and transmissivity is greater than 8,000 ft²/d. The Weinstein production well (W-36) in this area yields more than 500 gal/min. Additional production capacity from this area probably is limited by potential interference with well W-36 that taps from this small aquifer.





Saturated thickness of the coarse sand and gravel aquifer along Colby Brook exceeds 40 ft, and transmissivity is less than 8,000 ft²/d. Based on the extent and saturated thickness of permeable material at well W-1 to W-6, W-34 and W-35 (transmissivity averages 7,000 ft²/d), the yield of this aquifer potentially is as large as that from aquifers near Darrah Pond and Nesenkeag Brook.

The 1990 *Litchfield Water Resources Management and Protection Plan* by the Planning Board comprehensively examines existing water resources and their management and protection. The document analyzes bedrock and till aquifers as well as stratified drift aquifers. The study cites a 1983 study *Nashua, New Hampshire Regional Groundwater Investigation* by Metcalf and Eddy, Inc. noting that the potential yield from aquifers in Litchfield was medium to high with groundwater acceptable for potable use, with the exception of naturally occurring manganese. Drinking water standards have become more restrictive under the Clean Water Act and Safe Drinking Water Act amendments that occurred since the 1983 Metcalf and Eddy, Inc. study.





Map 3 - 4: Stratified Drift Aquifer Resources

Active Public Water Supply


System Type

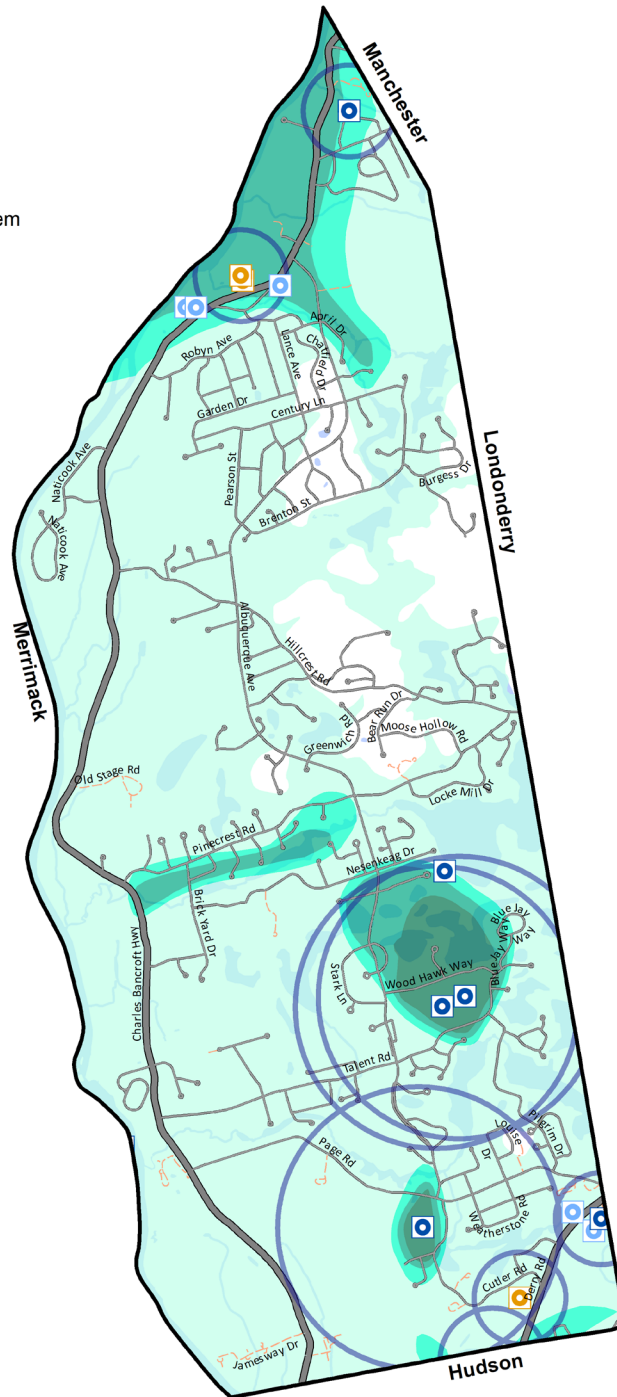
-  Community System
-  Transient, non-community system
-  Non-transient, non-community system
-  Wellhead Protection Area

Aquifer Potential Yield

-  Low-Moderate (0 - 2000 ft²/d)
-  Moderate (2001 - 4000 ft²/d)
-  Moderate-High (4001 - 8000 ft²/d)
-  High (8001+ ft²/d)



0 0.5 1
 Mile



Data Sources: Public Water Supplies, Wellhead Protection Areas: NH Department of Environmental Services; Aquifer Yield: NH Granit derived from Toppin 1987, USGS.

Till Aquifers

Till aquifers are also composed of glacial material. Material porosity and thickness are the main differences between till and stratified drift aquifers. Till aquifers contain an unsorted mixture of clay, silt and gravel that were ground up from solid rock by the glaciers. This mixture of different sized particles limits the available pore space for water storage. Therefore, it is difficult for these deposits to store and transmit water. Wells drilled in till usually yield only small volumes of groundwater adequate for private residential use.

The only protection mechanism provided for wells in till deposits is the minimum setback requirements from property boundaries and septic leach fields. To protect these individual water supplies the Town should consider adopting more stringent setback requirements to prevent contamination.

Bedrock Aquifers

Bedrock aquifers are composed of fractured rock or ledge with groundwater stored in the fractures. These aquifers are very complex because bedrock fractures decrease with depth, "pinch out" over short distances and do not carry much water. Locating water supply wells in bedrock aquifers is often a hit or miss proposition because it is difficult and costly to determine the location of fractures. Bedrock aquifers exist in Litchfield and are used for individual wells. Again, the only source of protection for bedrock aquifers is minimum requirements from property lines and septic leach fields. Recharge areas for bedrock aquifers are difficult to pinpoint which complicates any effort of protection.

Drinking Water Resources and Potential Contaminant Sources

There are two key issues affecting water resources in the region. The first is the increased amount of impervious surface, which reduces the natural infiltration of stormwater and the recharge of groundwater resources. Stormwater contains many sources of contaminants, which are piped or flow over impervious surfaces and drain directly into surface waters without natural soil filtration. Chemicals in runoff can also lead to long term pollution of groundwater. **Map 3 - 4** illustrates aquifer location and transmissivity in Litchfield.

The second issue is the demand for water. The continued growth of Litchfield and NRPC Region has fueled more pressure on current water resources. This makes it imperative to monitor and maintain the quality of all the water resources in Litchfield and the region. In the below sections several potential contaminants to the water supplies have been identified and explained further. **Map 3 - 5** illustrates potential contamination sources.

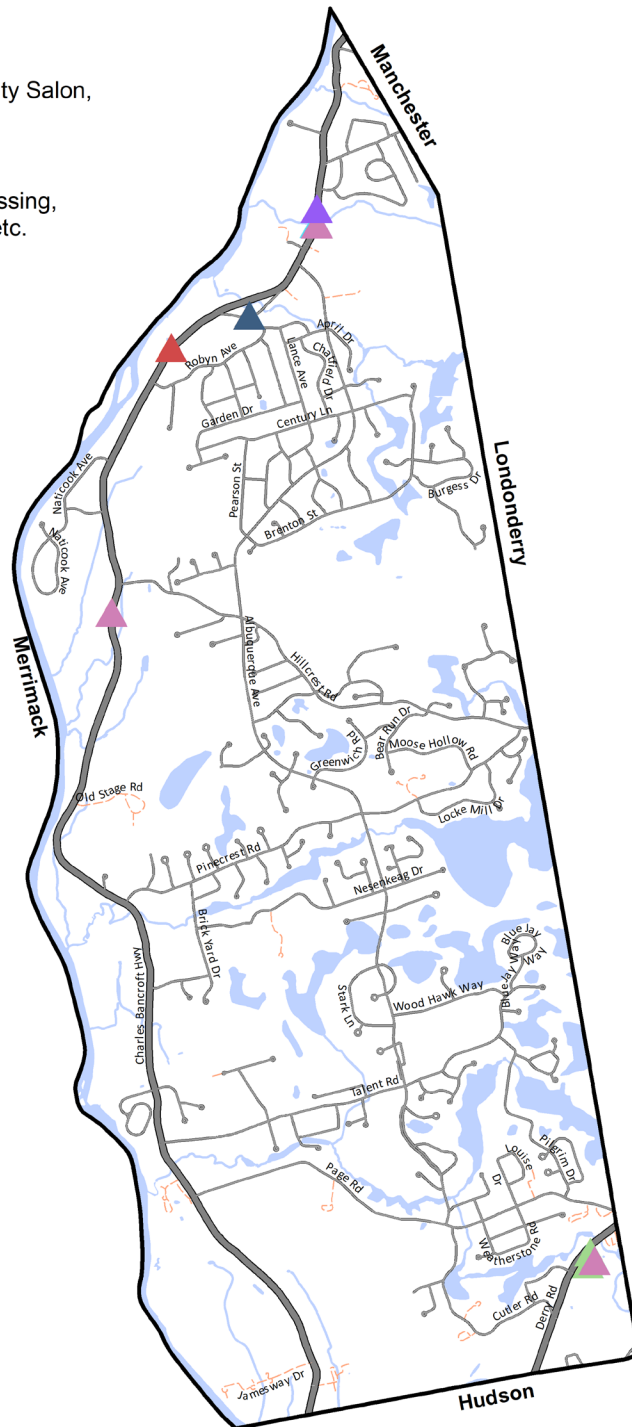
Map 3 - 5: Potential Groundwater Contamination Sources

Site Type

- ▲ Dry Cleaner, Laundromat, Beauty Salon, Car Wash
- ▲ Construction Site
- ▲ Paint, Refinishing, Photo Processing, Printing, Small Engine Repair, etc.
- ▲ Manufacturing
- ▲ Machine Shop
- ▲ Autobody

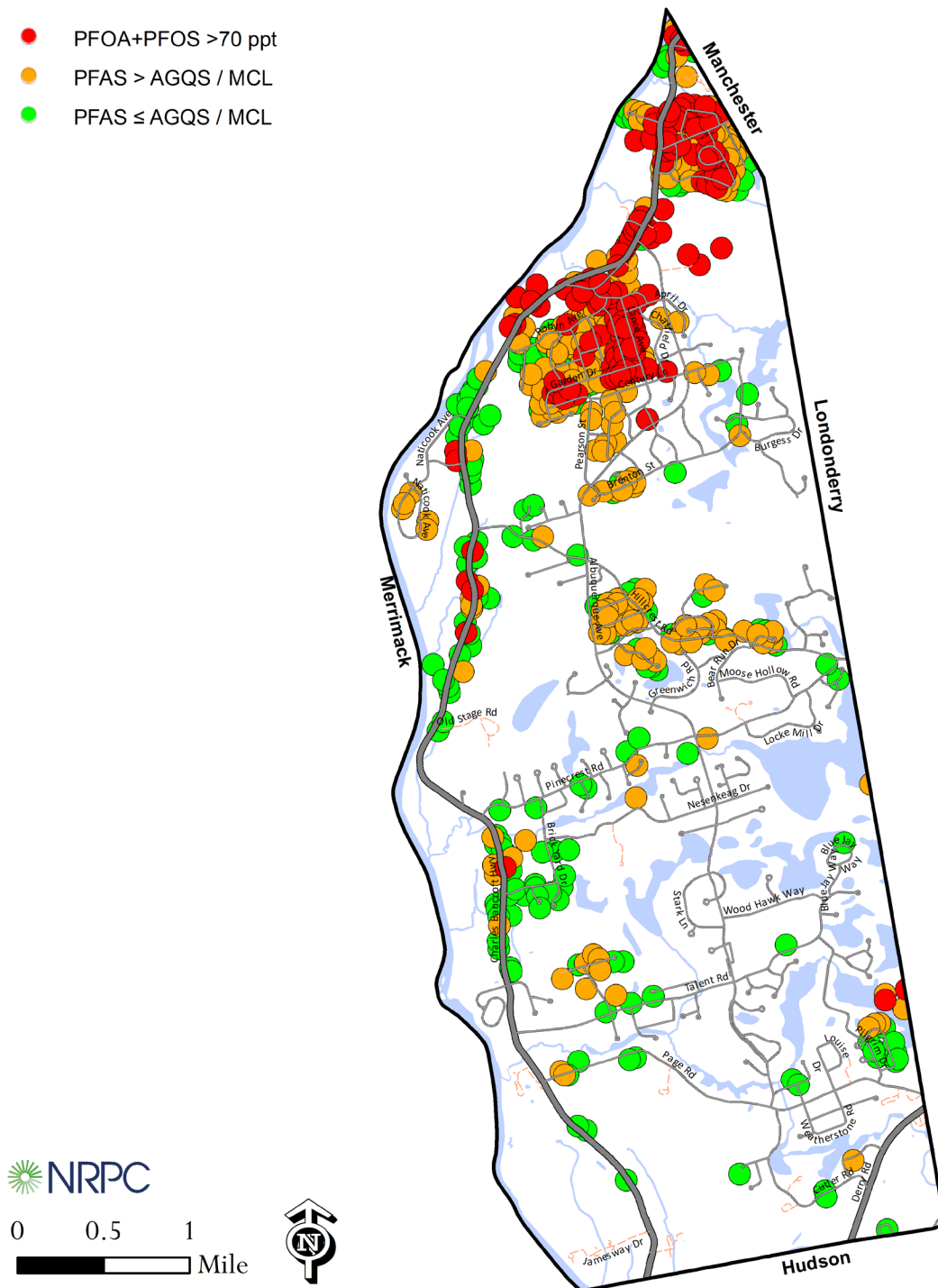


0 0.5 1
 Mile



Data Source: NH Department of Environmental Services One-Stop Data Mapper, Local Potential Contamination Sources 2021.

Map 3 - 6: PFOA + PFOS Detections in Groundwater Samples



Data Source: New Hampshire Department of Environmental Services PFAS sampling data, Environmental Monitoring Database; accessed December 2021.

Underground Storage Tanks

Leaks in improperly equipped underground storage tanks (USTs) are difficult to detect and may go unnoticed for a long time. Small leaks of only a few gallons can contaminate millions of gallons of ground water. The State regulates USTs where the cumulative volume of all tanks at the facility is 1,100 gallons or more. Some tanks, including those containing non-petroleum-based chemicals and those containing heating oil for on-site residential consumption are exempted.

Per- and Polyfluoroalkyl Substances (PFAS)

Per- and Polyfluoroalkyl Substances (PFAS) are a group of synthetic chemicals that have been used for decades to manufacture household and commercial products that resist heat, oil, stains, grease, and water. PFAS have been used in many consumer products, including non-stick cookware, stain-resistant furniture and carpets, waterproof clothing, microwave popcorn bags, fast food wrappers, pizza boxes, shampoo, and dental floss. They have also been used in certain firefighting foams and various industrial processes. The widespread use of these chemicals has led to their appearance in drinking water sources in NH. Recent examples include the widespread contamination of public and private drinking water supplies in Merrimack, Litchfield and Bedford resulting from emissions from the Saint-Gobain Performance Plastics facility in Merrimack that came to light in 2016, as well as the Coakley Landfill and former Pease Air Force Base superfund sites in the Seacoast area. Concern for long term public health prompted legislation enabling the state to set Maximum Contaminant Levels (MCLs) in 2020. These MCL's apply to public water systems and not to private wells, however the NHDES strongly recommends periodic testing of private wells for PFAS among other substances.

Household Hazardous Waste

Household Hazardous Wastes (HHW) come from everyday products used in the home, yard, or garden. By definition, they are corrosive, flammable, toxic, or reactive. Examples include paints, adhesives, solvents, pool chemicals, pesticides, fertilizers, drain openers and auto chemicals. Disposal in the trash, down the sink, into storm drains, or in the woods poses a threat to water quality and may kill fish and wildlife if the chemicals are released into the environment. Household toxins may also injure human and animal health through exposure due to careless storage and handling. NRPC coordinates household hazardous waste collections for 11 communities in the region, including Litchfield. In 2020, the HHW Collection program removed 129,965 pounds from the waste stream that could have otherwise impacted our environment. Six collection events are scheduled each year between April and November that allow residents to dispose of these products properly. Litchfield hosts one hazardous waste collection every other year (open to all district members) to better serve the eastern reaches of the region. Collection dates and other information can be found at www.nashuarpc.org/hhw.

Junkyards

Since 1965, all municipalities in New Hampshire have had the responsibility to license junkyards at the local level. This responsibility is contained in RSA Chapter 236 sections 111 through 129. It applies to all municipalities, whether or not there is a local zoning ordinance. The obligation to license is broad. The landowner does not need to be involved in a commercial operation, or even intend to sell the material. If the material is a motor vehicle or auto parts, an accumulation amounting to two or more vehicles is enough to require a license. Under state statute, it no longer matters whether the vehicles are registered; they become "junk" if they are no longer intended for operation on the highways. The legislature has provided a range of remedial options for use in these cases. In most instances, assistance

should be sought from the municipal attorney before commencing a court proceeding. Fines and penalties may be assessed through the court system pursuant to RSA Chapter 236 Sections 127-129.

- Improve the licensing checklist to include the review of the National Pollution Discharge Elimination System permit, especially the facility's Stormwater Pollution Prevention Plan.
- Enforce licensing requirements of all junkyard facilities.
- Conduct a site walk prior to license renewal to make further recommendations for the protection of natural resources.
- Update and increase the fines for violations.

Arsenic and Radon/Uranium

Southern New Hampshire is a rapidly growing region that has been identified as having higher than average concentrations of arsenic and radionuclides in drinking water from groundwater sources. This conclusion is based on the analysis of public bedrock wells as required by the Safe Water Drinking Water Act. According to the USGS, high levels in ground water are probably derived from geologic origins. However, in some areas, arsenic may originate from past human activity such as the use of arsenical pesticides. The quality of water obtained from private wells in New Hampshire is not regulated. Private wells are often not tested unless homeowners are made aware of the need to do so, or if testing is a condition prior to granting an occupancy permit. Fractured bedrock aquifers have the highest risk for arsenic contamination. The State of New Hampshire is aggressively promoting the testing of private wells. It is recommended that residents have their wells tested, and that information concerning arsenic and radon be added to the town website.

Stormwater Runoff / MS4

The development of land for residential, commercial, or industrial purposes necessarily increases the amount of impervious surface area within any given site due to the construction of buildings, roads, driveways, parking lots and other improvements. Impervious surfaces reduce the natural infiltration of stormwater into the ground, reducing recharge of groundwater resources. This is particularly true where stormwater is discharged into a storm drainage system that exports stormwater off of a site and out of a watershed. Development can also reduce groundwater recharge through increased evaporation resulting from land clearing. Where increased imperviousness results in direct stormwater discharges into streams and rivers, the result is often alteration of the natural flow of the stream, causing erosion and sedimentation, loss of aquatic wildlife habitat and increased flood hazards.

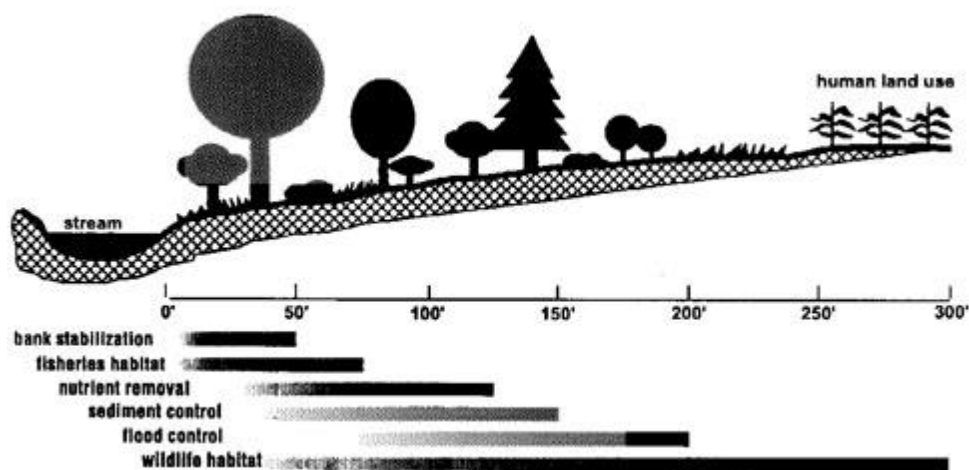
Because Litchfield contains significant areas that are defined as "urbanized" by the US Census, Litchfield is subject to federal MS4 stormwater management regulations under the EPA Clean Water Act (CWA) and requires a permit for discharges to the environment. A municipal separate storm sewer system (MS4) includes the stormwater collection, conveyance, and outfall structures within the town. These structures include (but are not limited to) catch basins, drain manholes, culverts, stormwater basins, retention ponds and swales.

Local drainage systems, whether natural or constructed, are important features that generally carry stormwater runoff away from developed areas to undeveloped areas, waterbodies, and wetlands. Although these drainage systems help to manage stormwater in our built environment, they are also a primary source of untreated pollutants in receiving waters including pathogens such as virus and bacteria; phosphorous; nitrates; heavy metals, oil, MBTE, pesticides, herbicides, and many other

pollutants. These untreated pollutants in stormwater runoff are defined by the U.S. Environmental Protection Agency (EPA) as “nonpoint source pollution,” meaning that the source of the pollution is not directly attributable to a single spatial point or polluter. Stormwater runoff from streets, parking lots, and lawns picks up and carries contaminants as it moves across the ground surface before entering into local drainage systems. Non-point source pollution and urban runoff in particular, is now acknowledged as being the most serious threat facing surface and groundwater resources in New Hampshire.¹

Litchfield has taken significant steps toward addressing stormwater management and complying with EPA’s MS4 Permit requirements. The town has adopted a Stormwater Management Plan, most recently updated in June of 2021, is an active participant in the Lower Merrimack Valley Stormwater Coalition and has posted and has a page dedicated to stormwater management on the town’s website. The stormwater management page includes an array of useful information sheets and links to resources for homeowners, businesses and other stakeholders on issues including proper septic system maintenance, lawn care, pet waste disposal, and management of construction sites. In addition, Litchfield’s *Clean Water Initiative* provides educational information and resources to the public on best management practices to prevent adverse stormwater related impacts to the town’s surface and groundwater resources.

Buffer Widths / Riparian Buffers / Streamside Forests



The following discussion on buffer widths is adapted from the publication “*Riparian Buffers for the Connecticut River Watershed*” prepared by the Connecticut River Joint Commissions of New Hampshire and Vermont in 2000. The Commission is made up of Federal, state, and private organizations. There is no single generic buffer which will keep water clean, stabilize banks, protect fish and wildlife, and satisfy human demands on the land. The minimum acceptable width is one that provides acceptable levels of all needed benefits at an acceptable cost, typically 50' from the top of the bank. Each foot of additional width increases the effectiveness of the buffer. Buffers are useful for the following purposes:

- *To Stabilize Eroding Banks.* Good erosion control on smaller streams may require no more than shrubs and trees or a managed grass buffer. If there is active bank erosion, or on larger streams, more than 50' may be necessary. Severe bank erosion on larger streams requires engineering to stabilize and protect the bank – effective engineered solutions can be accomplished with selective vegetative cover.
- *To Filter Sediment and Attached Contaminants from Runoff.*
For slopes less than 15%, most sediment settling occurs within a 35' wide buffer of grass. Greater width is needed on steeper slopes, for shrubs and trees, or where sediment loads are particularly high.
- *To Filter Dissolved Nutrients and Pesticides from Runoff.*
A width up to 100' or more may be necessary on steeper slopes and less permeable soils to allow runoff to soak in sufficiently, and for vegetation and microbes to work on nutrients and pesticides. Most pollutants are removed within 100', although in clay soils, may require up to 500'.

Shoreland Protection Act

The Shoreland Water Quality Protection Act, originally named the Comprehensive Shoreland Protection Act (CSPA), was enacted into law in the 1991. Significant amendments were passed in 2008. The Act establishes minimum standards for the subdivision, use and development of shoreland areas adjacent to the state's public waters. When repairs, replacements, improvements, or expansions are proposed for existing development, the law requires these alterations to be consistent with the intent of the Act. Development within the protected shoreland must always comply with all applicable local and state regulations.

Protected shoreland includes all-natural freshwater bodies without artificial impoundments, artificially impounded freshwater bodies, rivers, coastal water, and all land located within 250 feet of the reference line of public waters. Public waters are all waterbodies with a surface area of ten or more acres, all fourth order or higher watercourses, estuaries, and coastal waters. Long Pond, Harris Pond, Little Island Pond, Gumpas Pond, and Beaver Brook below the junction of Golden Brook are the only waterbodies that fall under the provisions of the Act. The reference line for these ponds is the natural mean high-water level. No fertilizer, except limestone can be used within 25 and 250 feet of the reference line. Only low phosphate, slow-release nitrogen fertilizer or limestone may be used beyond the twenty-five feet of the reference line. Natural woodland buffers must adhere to the following:

1. Where existing, a natural woodland buffer must be maintained within 150 feet of the reference line.
2. Tree cutting is limited to 50% of the basal area of trees, and maximum of 50% of the total number of saplings in a 20-year period.
3. A healthy, well-distributed stand of trees must be maintained.
4. Stumps and their root systems must remain intact in the ground within fifty feet of the reference line.

C. Agriculture

Agricultural land is one of the most important forms of open space in a community. In addition to the production of crops and livestock, farms provide scenic vistas and help create rural character. Farming was a major economic activity in Litchfield during the 1800's and early 1900's; however, as the population migrated to the cities and more fertile lands in the Midwest, many farms were abandoned with the fields and pastures growing into the forests we see today. Because of this migration and the agricultural limitations of the climate, New Hampshire relies heavily on other states to produce the majority of its food. In addition, food prices are generally higher here than in other regions because New England is at the end of the food transportation supply line.

Agricultural lands are basically defined in two ways. First, by soil type (identified areas may or may not be actively used for farming) and second, by active agricultural uses, which may or may not be located on agricultural soils. The following sections discuss the existing agricultural resources of the Town based on soils and active agricultural use.

There are 868 acres of 'Prime' agricultural soils within Litchfield and 19 acres of soils classified as 'Statewide' importance. Prime agricultural soils cover nearly one tenth of all Town lands, although not all of the prime and statewide soils are being actively farmed for crops.

There are 40 parcels of land in Litchfield that are coded for Agricultural land use. Together they add up to 950 acres, which is 9.7% of the town's 9792 total acres.

Many of the largest vegetable and plant farms (often known as truck farms) in the region are in Litchfield. Vegetable farming was the fourth most common type of farm operation, and vegetables were the third most prevalent type crops in 1974 in Hillsborough County. Sweet corn, squash, tomatoes, and cabbage are commonly grown vegetables. Other crops raised in Litchfield are fruits, trees, garden plants, sod, alfalfa, and corn. Litchfield is home to the largest certified organic farm in New Hampshire. According to the 1997 USDA Census of Agriculture, outside of lands used to raise hay or corn for grain or silage, there were 7,000 acres in the state used to grow vegetables or fruit. If 600 acres in Litchfield are used for one of these two purposes, this represents 8.6 percent of all New Hampshire lands used for these purposes.

Like the rest of the region, farming has decreased in recent years because of economic conditions and conversions of open agricultural land to build development to service commercial and residential growth. While it is difficult to define how much of the existing active farmland can be preserved, large parcels of the best soils would have the highest chance of economic viability for agriculture.

Given that open land places less of a tax burden on the Town and residents than residential or commercial developments, providing a tax incentive for active agricultural land would not significantly increase the tax burden on other residents. Decreasing the tax burden on land used for agriculture is good for farmers and those searching to maintain Litchfield's rural lifestyle.

Farmland Preservation is an important natural resources protection goal of the Conservation Commission and the community at large. Agricultural preservation helps meet the future demand for food resources; in addition, it provides a physical buffer to major proposed road and bridge projects. Farmland protection is also a regional environmental preservation priority.

One local focus is 89 acres of prime agricultural soils with Merrimack River frontage that forms an ecological and aesthetic buffer to the northern Commercial Zone. It is also contiguous with 64 acres already protected by the Town and a local land trust. The area abuts several Merrimack River Islands and is prime habitat.

Map 3 - 7: Agricultural Land Use



Data Sources: Prime Farmland Soil: 2020 SSURGO database; Agricultural Land Use: NRPC GIS parcel database derived from local assessing land use codes.

D. Wildlife

Maintenance of quality habitats is important to the survival of all species. Change is inevitable; however, some species are less able to adapt to changes in habitat than others. The fields, forests, streams, and wetlands provide habitats for a diversity of wildlife and plant species. The tiers of habitat quality listed below, and shown on **Map 3 - 9** were based on an intensive statewide analysis:

Tier 1 rating was given to areas that contain the *highest condition habitat in the state*.

Tier 2 areas contain *the highest condition rank in the biological region* (defined by eco-region for terrestrial habitats, and watershed for wetland and aquatic habitats).

Tier 3 includes supporting landscapes such as watersheds containing top-ranked stream networks and lakes, large forest blocks, or specific animal, plant, and natural community occurrences of special note.

The Town also provides habitat for the usual game and non-game species of birds, amphibians, fish, reptiles, and mammals, such as deer, turkeys, raccoons, pheasant partridge, fox, ducks, Canada geese, eagles, and other species native to New Hampshire. In addition, a great blue heron rookery has been located in the Town. The diversity found in types of habitats, ponds, wetlands fields, and forests, means diversity in types of animal species found in the Town. It is important to maintain a balance between fields, naturally succeeding areas, forests, and wetlands to ensure the quality and quantity of wildlife habitat. Therefore, the Town should protect different types of habitats to ensure the proliferation of species diversity.

**Table 3 - 6: New Hampshire Natural Heritage Inventory
Rare Species and Exemplary Natural Communities List for Litchfield**

Flag	Species or Community Name	# Locations Listed in the last 20 Years			
		Federal	State	Town	State
	<i>Natural Communities – Terrestrial</i>				
~	-Dry Appalachian oak forest	-	-	Historical	15
~	- Red oak - ironwood - Pennsylvania sedge woodland	-	-	Historical	12
***	- Rich Appalachian oak rocky woods	-	-	1	17
	<i>Natural Communities – Palustrine</i>				
~	- Atlantic white cedar - yellow birch - pepperbush swamp	-	-	Historical	16
~	- Sandy pond shore system	-	-	Historical	12
~	- Swamp white oak floodplain forest			1	7
	<i>Plants</i>				
**	anemone meadow-rue - <i>Thalictrum thalictroides</i>	-	E	1	8
**	bashful clubsedge - <i>Trichophorum planifolium</i>	-	E	2	4
**	bird-foot violet - <i>Viola pedata</i> var. <i>pedata</i>	-	T	4	17
**	black-seeded spear grass - <i>Piptochaetium avenaceum</i>	-	E	1	1
**	blue sedge - <i>Carex glaucoidea</i>	-	T	2	8
**	blunt-lobed cliff fern - <i>Woodsia obtusa</i> ssp. <i>obtusa</i>	-	E	1	11
**	brown bog sedge - <i>Carex buxbaumii</i>	-	E	1	2
~	bulbous bitter-cress - <i>Cardamine bulbosa</i>	-	E	Historical	5
**	button sedge - <i>Carex bullata</i>	-	E	1	7

**	clasping milkweed - <i>Asclepias amplexicaulis</i>	-	T	1	15
~	clustered sedge - <i>Carex cumulata</i>	-	T	Historical	20
**	common star-grass - <i>Hypoxis hirsuta</i>	-	T	4	20
~	dragon's-mouth - <i>Arethusa bulbosa</i>	-	E	Historical	24
~	early crowfoot - <i>Ranunculus fascicularis</i>	-	E	Historical	4
**	eight-flowered six-weeks grass - <i>Vulpia octoflora</i> var. <i>tenella</i>	-	E	1	5
**	four-leaved milkweed - <i>Asclepias quadrifolia</i>	-	E	3	10
~	greater fringed-gentian - <i>Gentianopsis crinita</i>	-	T	Historical	30
***	hairy bedstraw - <i>Galium pilosum</i> var. <i>pilosum</i>	-	E	1	6
***	hoary mountain-mint - <i>Pycnanthemum incanum</i> var. <i>incanum</i>	-	E	3	6
***	late purple American-aster - <i>Symphyotrichum patens</i> var. <i>patens</i>	-	T	4	12
**	licorice goldenrod - <i>Solidago odora</i> ssp. <i>odora</i>	-	T	1	26
~	long-headed windflower - <i>Anemone cylindrica</i>	-	E	Historical	11
**	lopsided rush - <i>Juncus secundus</i>	-	E	2	8
***	meadow garlic - <i>Allium canadense</i> var. <i>canadense</i>	-	E	1	5
~	narrow-leaved pinweed - <i>Lechea tenuifolia</i>	-	E	Historical	4
~	narrow-leaved white-topped-aster - <i>Sericocarpus linifolius</i>	-	E	Historical	5
~	northern wild senna - <i>Senna hebecarpa</i>	-	E	Historical	10
**	palmate violet - <i>Viola palmata</i> var. <i>palmata</i>	-	E	1	3
~	purple milkweed - <i>Asclepias purpurascens</i>	-	E	Historical	4
**	red threeawn - <i>Aristida longespica</i> var. <i>geniculata</i>	-	T	2	18
***	river birch - <i>Betula nigra</i>	-	T	1	10
~	rock muhly - <i>Muhlenbergia sobolifera</i>	-	E	Historical	6
***	round-leaved trailing tick-trefoil - <i>Desmodium rotundifolium</i>	-	T	4	14
**	sicklepod rockcress - <i>Boechera canadensis</i>	-	T	4	9
**	slender bush-clover - <i>Lespedeza virginica</i>	-	E	3	8
~	slender knotweed - <i>Polygonum tenue</i>	-	E	Historical	5
~	slender muhly - <i>Muhlenbergia tenuiflora</i>	-	E	Historical	3
**	smooth forked whitlow-wort - <i>Paronychia canadensis</i>	-	E	4	9
*	smooth small-leaved tick-trefoil - <i>Desmodium marilandicum</i>)	-	E	1	4
***	Torrey's mountain-mint - <i>Pycnanthemum torrei</i>	-	E	2	3
~	wild chives - <i>Allium schoenoprasum</i>	-	E	Historical	7
~	wild goat's-rue - <i>Tephrosia virginiana</i>	-	E	Historical	7
~	wild lupine - <i>Lupinus perennis</i> ssp. <i>perennis</i>	-	T	Historical	30
<i>Vertebrates – Birds</i>					
**	Common Loon - <i>Gavia immer</i>		T	1	339
<i>Vertebrates – Reptiles</i>					
**	Blanding's Turtle - <i>Emydoidea blandingii</i>	-	E	12	1098
**	Eastern Box Turtle - <i>Terrapene carolina</i>	-	E	1	19
**	Northern Black Racer - <i>Coluber constrictor</i>		T	1	70
**	Spotted Turtle - <i>Clemmys guttata</i>		T	6	165
***	Wood Turtle - <i>Glyptemys insculpta</i>		SC	3	281
<i>Vertebrates – Fish</i>					

**	American Eel - <i>Anguilla rostrata</i>	-	SC	1	177
~	Banded Sunfish - <i>Enneacanthus obesus</i>	-	SC	Historical	32
**	Redfin Pickerel - <i>Esox americanus</i>	-	E	1	30
	<i>Invertebrates- Mollusks</i>				
***	Brook Floater - <i>Alasmidonta varicosa</i>	-	E	1	33
**	Eastern Pond Mussel - <i>Ligumia nasuta</i>		SC	1	8

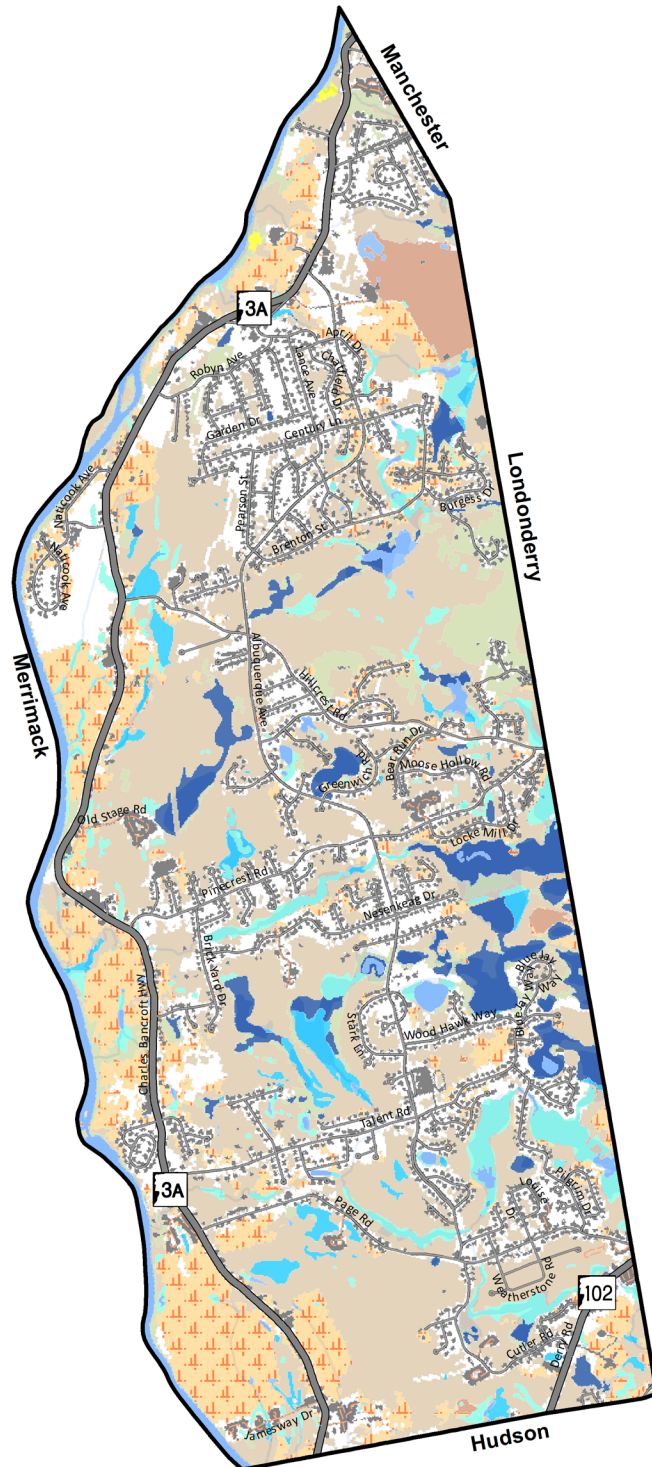
Map 3 - 8: Habitat Types

Habitat Type

- Alpine
- Appalachian oak-pine
- Cliff and Talus slope
- Coastal island
- Developed Impervious
- Developed or Barren land
- Dune
- Floodplain forest
- Grassland
- Hemlock-hardwood-pine
- High-elevation spruce-fir
- Low-elevation spruce-fir
- Northern hardwood-conifer
- Northern swamp
- Open water
- Peatland
- Pine barren
- Rocky ridge
- Salt marsh
- Sand/Gravel
- Temperate swamp
- Marsh and shrub wetland



0 0.5 1
Mile

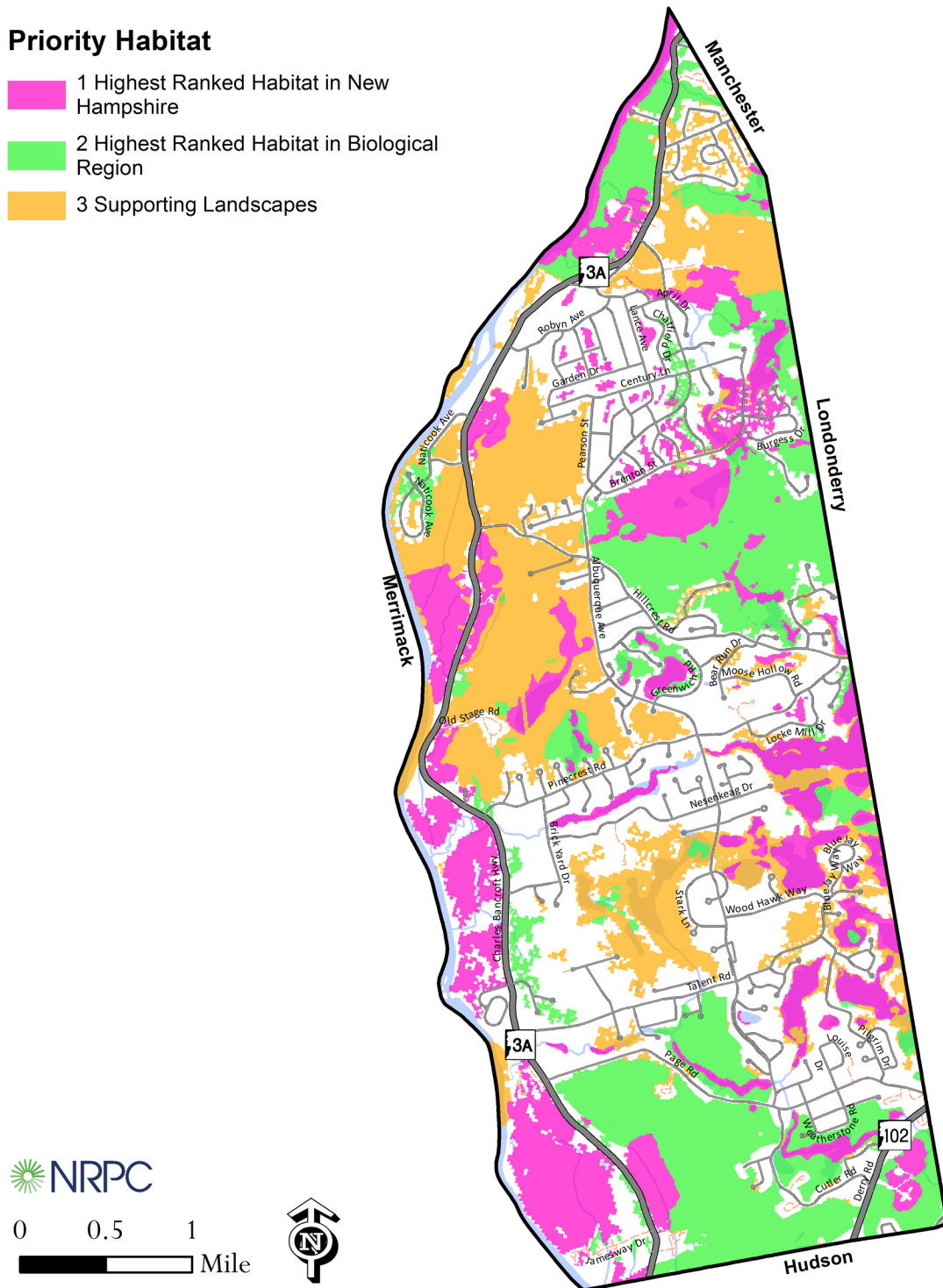


Data Source: New Hampshire Fish and Game Wildlife Action Plan (WAP) 2020.

Map 3 - 9: Priority Habitats

Priority Habitat

-  1 Highest Ranked Habitat in New Hampshire
-  2 Highest Ranked Habitat in Biological Region
-  3 Supporting Landscapes



Data Source: New Hampshire Fish and Game Wildlife Action Plan (WAP) 2020.

Endangered Species

The NH Fish and Game Department is the agency responsible for endangered animal species. NH Natural Heritage Bureau, a part of the NH Division of Forests and Lands is responsible for endangered plant species. The Audubon Society records the locations of endangered bird species in the State. There are no known endangered species in Litchfield. This does not mean that these particular species are not present in the Town, just that none have been documented. More information about specific endangered species and their habitats can be found at each of these agencies' websites and in the Wildlife Action Plan. There are historical records indicating that the Giant Rhododendron, a threatened plant, were located in Litchfield. Over the past twenty years, there have been three sightings of the Wood Turtle and one sighting of the American Eel, both of which are species of special concern. In addition, there has been one sighting each of the Southern Pygmy Clubtail and the Spatterdock Darner. The Conservation Commission should consider contacting these agencies every few years to keep apprised of changes to endangered species in the Town and the State.

Animals

Animal species commonly found in Litchfield include raccoons, opossums, skunks, muskrats, beavers, porcupines, woodchucks, white-tailed deer, squirrels, mice, bats, foxes, rabbits, and other indigenous species that are adapted to living near humans and urban activities. Sightings of coyote, otter, moose, and fisher cats have increased in Litchfield as they have in other municipalities. Larger animals that require extensive habitat areas or species that require solitude such as black bears, are rarely sighted in the Town.

Birds

Bird species vary according to the season; however, they are also dominated by those species commonly found in southern New Hampshire. Doves, woodpeckers, chickadees, and jays are found throughout the year while warblers, sparrows, hummingbirds, wrens, swallows, robins, and several species of raptors are generally seasonal residents. In addition, there are owls, wild turkeys, woodcocks, spruce grouse, blue herons, pileated woodpeckers, cardinals, bluebirds, and red-tail hawks. Other species such as ducks and geese may nest in the wetlands and ponds and many pass through the Town during spring and fall migrations.

The "Watch List" is a strategy of protecting birds and is the product of many individuals, agencies, and institutions within the Partners in Flight Program to call attention to birds at risk before they require federal listing, stressing preventative action today over last-ditch rescue attempts in the future. Watch List is based on a conservation priority scoring system (database maintained by the Colorado Bird Observatory) which is designed to conserve viable populations of birds and biological systems on which these species depend. The Watch List species are listed in the table below.

Each species on the Watch List receives a priority score of the sum of six criteria:

- Relative abundance
- Breeding distribution
- Non-breeding distribution
- Conservation threats during breeding season

- Conservation threats during the non-breeding season (habitat loss and degradation on the breeding and wintering grounds, domestic pets, brood parasitism by cowbirds, collisions with man-made objects, and pesticides)
- Population trend

One of the major causes of loss of bird habitat in New Hampshire is the lack of bottomland farms with open fields, hedgerows, grasslands, and the cutting of hayfields during nesting season. By 1850, at the height of agricultural development in New Hampshire, only 20% was forest, while the remaining 80% of Hillsborough County was cleared for livestock grazing, growing livestock feed, and other crops for home consumption. The agricultural properties were the first to be developed because of the topography, limited clearing/site preparation and soil compatibility for septic systems. Grassland birds such as bobolink, barn swallows, brown thrashers, meadowlarks, and field sparrows are on the decline with the loss of fields. Communities should strive to preserve the aesthetics and functions that open fields offer.

Increased development reduces the supply of natural cavities that bluebirds and other cavity nesters use to rear their young. Alien species from Europe like the House Sparrow and Starlings also compete for what few nesting cavities there are available. It is recommended to leave at least two standing dead trees or “snags” per acre are recommended. Mammals such as chipmunks, opossum, raccoons, etc. also use cavity trees, so larger numbers of snags benefit their populations as well.

Table 3 - 7: National Audubon Society’s Watch List

Bell’s Vireo	Black-throated Blue Warbler	Brown-headed Nuthatch
Canada Warbler	Golden-winged Warbler	Prairie Warbler
Prothonotary Warbler	Hooded Warbler	Rose-breasted Grosbeak
Scarlet Tanager	Summer Tanager	Wood Thrush
Yellow Warbler		

Source: Audubon Society’s Watch List, 2021.

Plants

Plant species in Litchfield are dominated by those species commonly found throughout southern Hampshire. The NH Natural Heritage Inventory (NHI) records indicate the presence of forty-six threatened, endangered or species of concern plant species in Town.

In addition, the New Hampshire Native Plant Protection Act identifies eleven plants as “special concern.” These species are not rare in New Hampshire, but their showy nature makes them vulnerable to over collection. The table identifies the species of special concern, many of which are found in Litchfield.

Another type of “species of concern,” are invasive plants that are not native to New Hampshire. Plants, seeds, or cuttings were imported by immigrants, the nursery trades, ship ballast, and the former Soil Conservation Service for erosion control. Invasive plants share common characteristics that allow them to thrive. Most plants produce great quantities of seed or have a very aggressive root system. These plants are able to establish in almost any environment including disturbed areas. Invasive plants dominate even healthy natural areas and disrupt natural succession. The invasive plant species found in

New Hampshire are listed in the table below. The NH Invasive Species Committee has also created an “Invasive Plant Species Watch List” of plants that may pose a threat as invasives in the near future that list is shown in **Table 3 - 10**.

Table 3 - 8: New Hampshire Plant Species of Special Concern

Trailing arbutus	Grass pink	White fringe orchids
Mountain laurel	Flowering dogwood	Large purple fringed orchid
Pitcher Plant	Pink lady's slipper	Rose pogonia
Lapland rosebay	Dutchman's breeches	

Source: NH Natural Heritage Inventory.

Table 3 - 9: Prohibited Invasive Plants in New Hampshire

Scientific name	Synonyms	Common name
<i>Acer platanoides</i> L.	<i>Acer platanoides</i> var. <i>schwedleri</i> Nichols.	Norway maple
<i>Ailanthus altissima</i> (P. Mill.) Swingle	<i>Ailanthus glandulosa</i> Desv.	Tree of heaven
<i>Alliaria petiolata</i> (Bieb.) Cavara & Grande	<i>Alliaria alliaria</i> (L.) Britt.; <i>Alliaria officinalis</i> Andr. ex Bieb.; <i>Erysimum alliaria</i> L.; <i>Sisymbrium alliaria</i> (L.) Scop.	Garlic mustard
<i>Alnus glutinosa</i> (L.) Gaertn.	<i>Alnus</i> (L.) Britt.; <i>Betula alnus</i> L. var. <i>glutinosa</i> L.	European black alder
<i>Berberis thunbergii</i> DC.		Japanese barberry
<i>Berberis vulgaris</i> L.		European barberry
<i>Celastrus orbiculatus</i> Thunb.		Oriental bittersweet
<i>Centaurea stoebe</i> L. ssp. <i>micranthos</i> (Gugler) Hayek	<i>Centaurea biebersteinii</i> DC.; <i>Centaurea maculosa</i> Lam., misapplied; <i>Centaurea maculosa</i> Lam. ssp. <i>micranthos</i> Gugler	Spotted knapweed
<i>Cynanchum louiseae</i> Kartesz & Gandhi	<i>Cynanchum nigrum</i> (L.) Pers.; <i>Vincetoxicum nigrum</i> (L.) Pers.	Black swallow-wort
<i>Cynanchum rossicum</i> (Kleopow) Borhidi	<i>Cynanchum medium</i> , of authors not R. Br.; <i>Vincetoxicum medium</i> , of authors not (R. Br.) Dcne.; <i>Vincetoxicum rossicum</i> (Kleopow) Barbarich	Pale swallow-wort
<i>Elaeagnus umbellata</i> Thunb. var. <i>parvifolia</i> (Royle) Schneid.	<i>Elaeagnus parvifolia</i> Royle	Autumn olive
<i>Euonymus alatus</i> (Thunb.) Sieb.	<i>Celastrus alatus</i> Thunb.	Burning bush
<i>Frangula alnus</i> P. Mill.	<i>Rhamnus frangula</i> L.	Glossy buckthorn

<i>Glyceria maxima</i> (Hartman) Holmb.	<i>Glyceria spectabilis</i> Mert. & Koch; <i>Molinia maxima</i> Hartman	Reed sweet grass
<i>Heracleum mantegazzianum</i> Sommier & Levier		Giant hogweed
<i>Hesperis matronalis</i>		Dames rocket

Source: <https://www.agriculture.nh.gov/publications-forms/documents/prohibited-invasive-species.pdf> (2017)

Table 3 - 10: NH Invasive Plant Species Watch List

Scientific Name	Synonyms	Common Name
<i>Abutilon theophrasti</i> Medik.		Velvetleaf Indian-mallow
<i>Acer ginnala</i> Maxim.		Amur maple
<i>Agrostemma githago</i> L. var. <i>githago</i>	<i>Lychnis githago</i> (L.) Scop.	Common corncockle
<i>Aira caryophyllea</i> L.	<i>Aspris caryophyllea</i> (L.) Nash	Common silver-hairgrass
<i>Allium vineale</i> L.		Crow garlic
<i>Amorpha fruticosa</i> L.	<i>Amorpha fruticosa</i> L. var. <i>angustifolia</i> Pursh; <i>A. fruticosa</i> L. var. <i>oblongifolia</i> Palmer; <i>A. fruticosa</i> L. var. <i>tennesseensis</i> (Shuttlw. ex Kunze) Palmer	False indigo-bush
<i>Aralia elata</i> (Miq.) Seem.	<i>Dimorphanthus elatus</i> Miq.	Japanese angelica-tree
<i>Barbarea vulgaris</i> Ait. f.	<i>Barbarea arcuata</i> (Opiz ex J. & K. Presl) Reichenb.; <i>B. stricta</i> , of authors not Andr.; <i>B. vulgaris</i> var. <i>arcuata</i> (Opiz ex J. & K. Presl) Fries; <i>Campe barbarea</i> (L.) W. Wight ex Piper; <i>C. stricta</i> , of authors not (Andr.) W. Wight ex Piper; <i>Erysimum barbarea</i> L.	Garden yellow-rocket
<i>Brassica juncea</i> (L.) Czern.	<i>Brassica juncea</i> (L.) Czern. var. <i>crispifolia</i> Bailey; <i>Sinapis juncea</i> L.	Chinese mustard
<i>Brassica nigra</i> (L.) W.D.J. Koch	<i>Sinapis nigra</i> L.	Black mustard
<i>Bromus tectorum</i> L.	<i>Anisantha tectorum</i> (L.) Nevski	Cheat brome

<i>Cardamine impatiens</i> L.		Narrow-leaved bitter-cress
<i>Centaurea jacea</i> L.	<i>Centaurea debeauxii</i> Gren. & Godr. ssp. <i>thuillieri</i> Dostál; <i>C. jacea</i> L. ssp. <i>decipiens</i> (Thuill.) Čelak.; <i>C. jacea</i> L. ssp. <i>pratensis</i> Čelak.; <i>C. pratensis</i> Thuill.; <i>C. thuillieri</i> (Dostál) J. Duvign. & Lambinon; <i>Cyanus jacea</i> (L.) P. Gaertn.; <i>Jacea pratensis</i> Lam.	Brown knapweed
<i>Centaurea nigra</i> L.	<i>Jacea nigra</i> (L.) Hill	Black knapweed
<i>Chelidonium majus</i> L.	<i>Chelidonium majus</i> L. var. <i>laciniatum</i> (P. Mill.) Syme; <i>C. majus</i> L. var. <i>plenum</i> Wehrhahn	Greater celandine
<i>Cirsium palustre</i> (L.) Scop.	<i>Carduus palustris</i> L.	Marsh thistle
<i>Cirsium vulgare</i> (Savi) Ten.	<i>Carduus lanceolatus</i> L.; <i>C. vulgaris</i> Savi; <i>Cirsium lanceolatum</i> (L.) Scop.	Common thistle
<i>Convolvulus arvensis</i> L.	<i>Strophocaulos arvensis</i> (L.) Small	Field bindweed
<i>Cytisus scoparius</i> (L.) Link	<i>Spartium scoparium</i> L.	Scotch broom
<i>Digitaria sanguinalis</i> (L.) Scop.	<i>Panicum sanguinale</i> L.	Hairy crabgrass
<i>Eichhornia crassipes</i> (Mart.) Solms-Laubach	<i>Eichhornia speciosa</i> Kunth; <i>Piaropus crassipes</i> (Mart.) Raf.	Common water-hyacinth
<i>Elymus repens</i> (L.) Gould	<i>Agropyron repens</i> (L.) Gould; <i>Elytrigia repens</i> (L.) Desv. ex B.D. Jackson; <i>Triticum repens</i> L.	Creeping wild-rye
<i>Epilobium hirsutum</i> L.		Hairy willow-herb
<i>Epipactis helleborine</i> (L.) Crantz	<i>Epipactis latifolia</i> (L.) All.; <i>Serapias helleborine</i> L.	Broad-leaved helleborine
<i>Euonymus europaeus</i> L.		European spindle-tree
<i>Euonymus fortunei</i> (Turcz.) Hand.-Mazz	<i>Euonymus fortunei</i> (Turcz.) Hand.-Mazz var. <i>radicans</i> (Sieb. ex Miq.) Rehd.; <i>E. fortunei</i> (Turcz.) Hand.-Mazz var. <i>vegetus</i> (Rehd.) Rehd.; <i>E. radicans</i> Sieb.	Climbing spindle-tree

	<i>ex</i> Miq.; <i>E. radicans</i> Sieb. <i>ex</i> Miq. var. <i>vegetus</i> Rehd.	
<i>Festuca filiformis</i> Pourret	<i>Festuca capillata</i> Lam.; <i>F. ovina</i> L. var. <i>capillata</i> (Lam.) Alef.; <i>F.</i> <i>tenuifolia</i> Sibthorp	Fine-leaved sheep fescue
<i>Ficaria verna</i> Huds. ssp. <i>fertilis</i> (Lawralrée ex Laegaard) Stace	<i>Ficaria verna</i> Huds. ssp. <i>bulbifera</i> A. & D. Löve; <i>Ranunculus ficaria</i> L. ssp. <i>bulbilifer</i> Lambinon; <i>R.</i> <i>ficaria</i> L. ssp. <i>bulbifera</i> (Marsden-Jones) Lawalree, an illegitimate name; <i>R. ficaria</i> var. <i>bulbifera</i> Marsden-Jones	Fig-crowfoot
<i>Froelichia gracilis</i> (Hook.) Moq.	<i>Oplotheca gracilis</i> Moq.	Slender cotton-weed
<i>Galium mollugo</i> L.		Whorled bedstraw
<i>Glechoma hederacea</i> L.	<i>Glechoma hederacea</i> L. var. <i>micrantha</i> Moric.; <i>G. hederacea</i> L. var. <i>parviflora</i> (Benth.) House; <i>Nepeta hederacea</i> (L.) Trevisan	Gill-over-the-ground
<i>Hylotelephium telephium</i> (L.) H. Ohba	<i>Sedum purpureum</i> (L.) J.A. Schultes; <i>S. purpurascens</i> W.D.J. Koch; <i>S. telephium</i> L.	Purple orpine
<i>Kochia scoparia</i> (L.) Schrad.	<i>Bassia scoparia</i> (L.) A.J. Scott; <i>Chenopodium scoparium</i> L.; <i>Kochia scoparia</i> (L.) Schrad. var. <i>pubescens</i> Fenzl; <i>K. scoparia</i> (L.) Schrad. var. <i>subvillosa</i> Moq.	Summer-cypress
<i>Lamium amplexicaule</i> L. var. <i>amplexicaule</i>		Common henbit
<i>Lamium purpureum</i> L.	<i>Lamium dissectum</i> With.; <i>L.</i> <i>hybridum</i> , of authors not Vill.	Red henbit
<i>Lonicera xylosteum</i> L.		Fly honeysuckle
<i>Lupinus polyphyllus</i> Lindl. var. <i>polyphyllus</i>	<i>Lupinus pallidipes</i> Heller; <i>L.</i> <i>polyphyllus</i> Lindl. var. <i>albiflorus</i> L.H. Bailey; <i>L. polyphyllus</i> Lindl. var. <i>pallidipes</i> (Heller) C.P. Sm.	Blue lupine

<i>Lychnis flos-cuculi</i> L. ssp. <i>flos-cuculi</i>	<i>Coronaria flos-cuculi</i> (L.) A. Braun; <i>Silene flos-cuculi</i> (L.) Clairville	Ragged robin lychnis
<i>Lysimachia arvensis</i> (L.) U. Manns & A. Anderb.	<i>Anagallis arvensis</i> L.; <i>A. arvensis</i> L. var. <i>caerulea</i> (Schreb.) Gren. & Godr.; <i>A. caerulea</i> Schreb.	Scarlet pimpernel
<i>Lysimachia vulgaris</i> L.		Garden yellow-loosestrife
<i>Miscanthus sinensis</i> Anderss.	<i>Miscanthus sinensis</i> Anderss. var. <i>gracillimus</i> A.S. Hitchc.	Chinese silvergrass
<i>Mycelis muralis</i> (L.) Dumort.	<i>Lactuca muralis</i> (L.) Fresen.	Wall-lettuce
<i>Myosotis scorpioides</i> L.	<i>Myosotis palustris</i> (L.) Hill	Water forget-me-not
<i>Nasturtium microphyllum</i> Boenn. ex Reichenb.	<i>Nasturtium officinale</i> Ait. f. var. <i>microphyllum</i> (Boenn. ex Reichenb.) Thellung; <i>Rorippa microphylla</i> (Boenn. ex Reichenb.) Hyl. ex A. & D. Löve	One-rowed water-cress
<i>Nasturtium officinale</i> Ait. f.	<i>Baeumerta nasturtium-aquaticum</i> (L.) Hayek; <i>Rorippa nasturtium aquaticum</i> (L.) Hayek; <i>Sisymbrium nasturtium-aquaticum</i> L.	Two-rowed water-cress
<i>Oenanthe javanica</i> (Blume) DC		Java water dropwort
<i>Persicaria longiseta</i> (Bruijn) Kitagawa	<i>Persicaria caespitosa</i> (Blume) Nakai var. <i>longiseta</i> (Bruijn) Reed; <i>Polygonum caespitosum</i> Blume var. <i>longisetum</i> (Bruijn) Steward; <i>P. longisetum</i> Bruijn	Oriental lady's-thumb smartweed
<i>Phellodendron amurense</i> Rupr.	<i>Phellodendron amurense</i> Rupr. var. <i>sachalinense</i> F. Schmidt; <i>P. japonicum</i> Maxim.; <i>P. sachalinense</i> (F. Schmidt) Sarg.	Amur corktree
<i>Poa compressa</i> L.		Flat-stemmed blue grass
<i>Poa nemoralis</i> L.		Wood blue grass
<i>Populus alba</i> L.	<i>Populus alba</i> L. var. <i>bolleana</i> Lauche	White poplar

<i>Ranunculus repens</i> L.	<i>Ranunculus repens</i> L. var. <i>degenerates</i> Schur; <i>R. repens</i> L. var. <i>erectus</i> DC.; <i>R. repens</i> L. var. <i>glabratus</i> DC.; <i>R. repens</i> L. var. <i>pleniflorus</i> Fern.; <i>R. repens</i> L. var. <i>villosus</i> Lamotte	Spot-leaved crowfoot
<i>Raphanus raphanistrum</i> L. ssp. <i>raphanistrum</i>		Wild radish
<i>Rhinanthus minor</i> L. ssp. <i>minor</i>	<i>Rhinanthus crista-galli</i> L., in part; <i>R. crista-galli</i> L. var. <i>fallax</i> (Wimmer & Grab.) Druce; <i>R. stenophyllus</i> (Schur) Schinz & Thellung	Little yellow-rattle
<i>Rumex acetosella</i> L. ssp. <i>pyrenaicus</i> (Pourret ex Lapeyr.) Akeroyd	<i>Acetosella vulgaris</i> (Koch) Fourr. ssp. <i>pyrenaica</i> (Pourret ex Lapeyr.) Á. Löve; <i>Rumex acetosella</i> L. var. <i>pyrenaicus</i> (Pourret ex Lapeyr.) Timbal-Lagrave; <i>R. pyrenaicus</i> Pourret ex Lapeyr.	Sheep dock
<i>Securigera varia</i> (L.) Lassen	<i>Coronilla varia</i> L.	Purple crown-vetch
<i>Silphium perfoliatum</i> L.		Cup-plant rosinweed
<i>Sinapis arvensis</i> L.	<i>Brassica arvensis</i> Rabenh.; <i>B. kaber</i> (DC.) L.C. Wheeler; <i>B. kaber</i> (DC.) L.C. Wheeler var. <i>pinnatifida</i> (Stokes) L.C. Wheeler	Corn charlock
<i>Solanum carolinense</i> L. var. <i>carolinense</i>		Carolina nightshade
<i>Solanum dulcamara</i> L.		Climbing nightshade
<i>Sonchus arvensis</i> L.	<i>Sonchus arvensis</i> L. ssp. <i>uliginosus</i> (Bieb.) Nyman; <i>S. uliginosus</i> Bieb.	Field sow-thistle
<i>Sorbaria sorbifolia</i> (L.) A. Braun	<i>Schizonotus sorbifolius</i> (L.) Lindl.; <i>Spiraea sorbifolia</i> L.	False spiraea
<i>Tanacetum vulgare</i> L.	<i>Chrysanthemum uliginosum</i> Pers.; <i>C. vulgare</i> (L.) Bernh.	Common tansy

<i>Tussilago farfara</i> L.		Coltsfoot
<i>Typha xglauca</i> Godr.		Hybrid cattail
<i>Valeriana officinalis</i> L.		Common valerian
<i>Vinca minor</i> L.		Lesser periwinkle

Source: <https://extension.unh.edu/resource/invasive-plants> (2018)

Aquatic Habitat

In addition to the highly visible species, habitats for other less visible species such as turtles, frogs, toads, salamanders, snakes, and numerous insects are present in the Town. The NHI lists the Blanding's Turtle, Eastern Box Turtle, Banded Sunfish, and two species of mollusks (invertebrates) as threatened or endangered in New Hampshire.

Forested riparian buffers benefit aquatic habitat by improving the quality of nearby waters through shading, filtering, and moderating stream flow. Shade in summer maintains cooler, more even temperatures, especially on small streams. Cooler water holds more oxygen and reduces stress on fish and other aquatic creatures. Some small streams in Litchfield are known to have populations of wild brook trout, which are especially sensitive to siltation and increased water temperatures caused by the removal of streamside vegetation.

In small well-shaded streams, the leaves, limbs, fruit, and insects that fall into the stream is an important energy source for the aquatic food chain. The detritus is broken down by invertebrates, fungi, and bacteria and are in turn eaten by benthic macro invertebrates and eventually fish. The woody debris that falls also creates stepped pools, providing cover for fish and their food supply (benthic macro invertebrates) while reducing erosion by slowing the flow of the stream.

Vernal Pools

Vernal or "spring" pools are essential for the life cycle of many invertebrates and amphibians. These temporary forested wetlands serve as a home to many of these species, which feed on the nutrients from fallen leaves. Pools can range in size from a few feet to several acres. Vernal pools are generally associated with forested wetlands, but can also be found within larger wetlands, such as oxbows in river floodplains or scrub-shrub wetlands. Most vernal pool animals do not live their entire lives in the pool but migrate in response to snow melt and early spring rains. The pools generally dry up by mid to late summer. Depending on the groundwater, some pools will refill in the autumn. Mole salamanders and wood frogs spend 90% of their lives in the surrounding uplands, perhaps as far as a quarter mile from the pool. Adults migrate to the pool for a few weeks to reproduce and surviving juveniles leave before the water dries.

Other organisms (e.g., snakes, turtles, insects, and birds) migrate from nearby wetlands to breed or feed in the productive pool waters. These animals return to more permanent wetlands. Other animals develop entirely in the pool and most survive the dry season. Fingernail clams and air-breathing snails burrow beneath the leaves that remain to await the return of water. Fairy shrimp deposit eggs in the dry pool that hatch after the pool refills.

The New Hampshire Fish and Game Department advocates identification of vernal pools as important wildlife habitat and wetlands of significance and provides guidance for their protection.⁵

Goals developed for future natural resources protection should include the documentation of important vernal pools and the protection of these natural resources to help ensure the biodiversity of the area. The identification and mapping of vernal pools on site plans and subdivision plans will provide an opportunity to mitigate the impacts to these sensitive areas.

New Hampshire Fish and Game Department's Non-Game and Endangered Wildlife Program collects information on any reptile and amphibians sighted. Volunteers equipped with field guides and report forms identify these creatures on warm, rainy nights in the spring. The Reptile and Amphibian Reporting Program (RAARP), provides important baseline data for species in need of protection.

Forest Resources

Forest types are distinctive communities of trees and are named for the predominant tree species occurring in that type. South central New Hampshire receives approximately forty-three inches of precipitation per year. Most of this precipitation is evenly distributed throughout the year, though there can be occasional droughts in the summer. As climate change intensifies it is likely that precipitation will be more concentrated in large rain events and will be less evenly distributed throughout the year than in the past.

Climate, elevation, soil conditions, and land use history all play a role in determining which forest type exists in a particular area. On abandoned agricultural sites, any open field left unattended will eventually revert to Pine and/or Oak type.

A forest type may be dominated by a single tree species, or it may be dominated by several species growing together. White pine often occurs as a pure species type. Northern Hardwood, which is composed of sugar maple, beech, yellow birch, red maple, white ash, and smaller amounts of other species, is a multiple species type.

The loss of forested land can have many effects on the environment, making it important to strategize lands to preserve. Litchfield has done considerable work in the past two decades to preserve major acreage as forested land providing large blocks of unfragmented habitat and areas for diverse forests to be maintained.

A forest block is an intact area of forest canopy without regard to ownership that is typically defined by travelled roadways, large water bodies, and non-forest land uses⁸. According to the Society for the Protection of New Hampshire Forests, a 500-acre forest block can provide adequate habitat for many species, help protect water quality, allow for sustainable forest management, and offer opportunities for outdoor recreation. A 5,000-acre block represents a minimum size for sustainable forest management at regional scale, as well as a framework that supports long-term ecological functions and processes.

Forests are a critical component of the natural landscape, integral to local ecosystem health and sustainability. Numerous technical assistance and financial resources are available to help ensure that forests are conserved to the greatest extent possible. The Town should identify major forest stands experiencing disease or decline as well as evaluate the feasibility of adopting forest protection provisions for unique areas.

Important natural environments would receive special attention. The REPP process discussed below has identified a number of local priorities that represent large tracts of contiguous forest. Most open space priorities are either in the east or west part of Town. The Planning Board should continually monitor for forest preservation opportunities that arise between the Litchfield Town line and Robyn Avenue which could provide forest links between the east and west parts of Litchfield.

The scenic and natural beauty is a major community resource -- and forests are a primary component of this rural character. To say that trees are key to Litchfield character is not an overstatement. Forests also:




- Build soils;
- Attenuate noise;
- Provide shade, reduce 'heat island' impacts of development and promote energy conservation;
- Prevent soil erosion;
- Promote water quality protection;
- Reduce air pollution;
- Increase property values; and
- Increase Biodiversity.

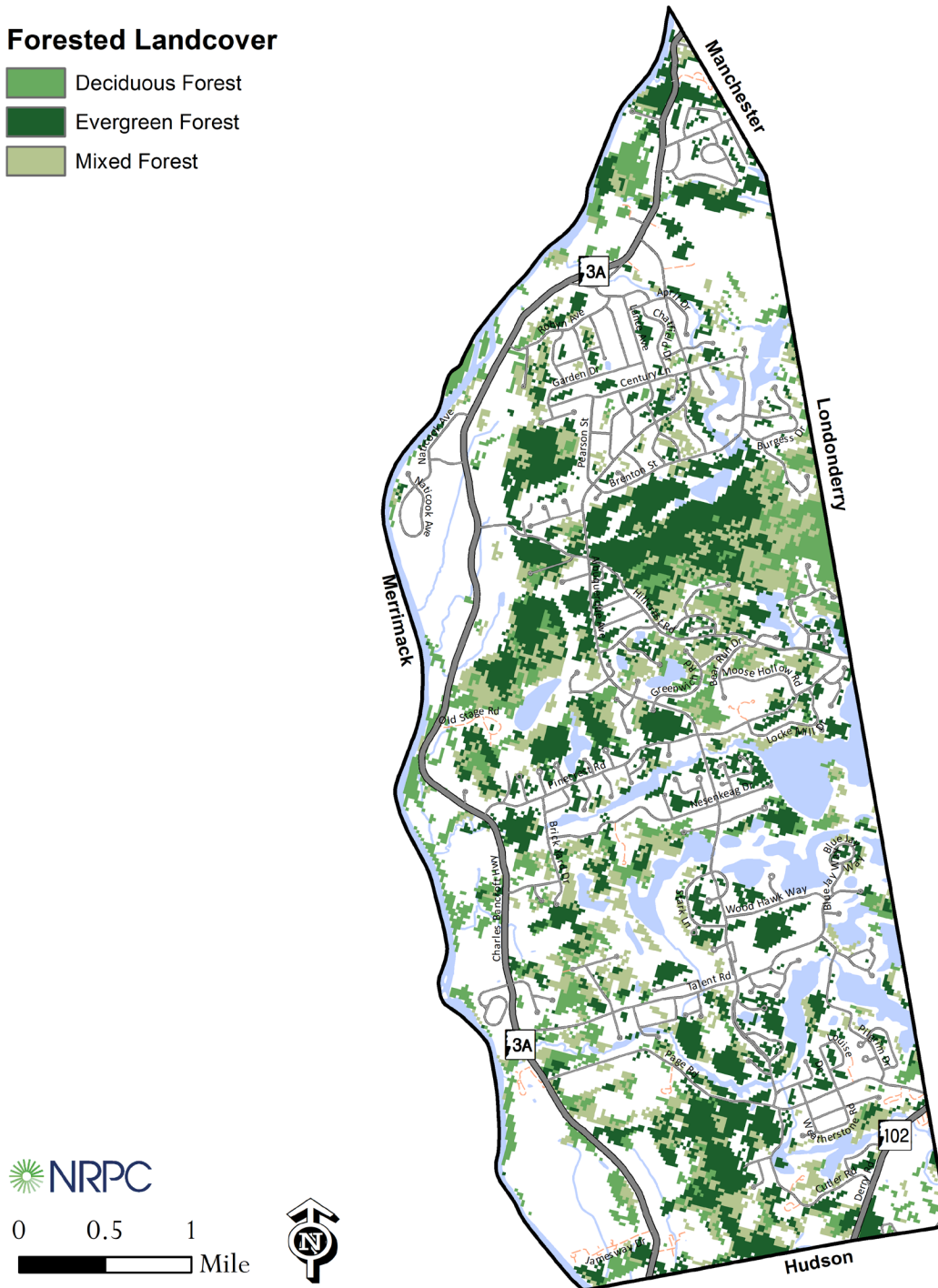
Forests are a major natural resource and landscape feature in Litchfield. Statewide the amount of developed land is increasing 2.5% each year. In spite of this, New Hampshire is 83% forest (2nd to Maine) and timber industries are 3rd largest (after tourism and manufacturing). Hillsborough County leads the state in white pine sawlog production. Red oak and sugar maple from the region are sought by export buyers. Forest resource protection should occur in Litchfield at the macro level to preserve large contiguous tracts of forest as well as at the micro level during site development as a way to preserve local environmental character and natural integrity in these developing areas.

Protecting forests have long been a local priority, demonstrated by establishment of the Litchfield State Forest and open space preserves achieved by the Conservation Commission. Litchfield is located in the rapidly growing southern tier of the State; therefore, it is important to examine patterns of forest resource use and threats. The highest densities of contiguous forests are around the Litchfield State Forest, east of Route 3A, and on the northern border with Londonderry (see Map 3-10). Based on a review of a 1998 aerial photograph of Litchfield, approximately 65 to 70 percent of Town lands are mature forests and wetlands. The remainder is farmland, buildings, cleared land, parking lots, roads and excavations. Since 1985 forests declined approximately eight percent, equaling 4/5 of one percent (0.8%) per year forest loss over the last 13 years.

Map 3 - 10: Forested Lands

Forested Landcover

-  Deciduous Forest
-  Evergreen Forest
-  Mixed Forest



Data Source: National Land Cover Database (NLCD) 2019.

E. Existing Recreation and Conservation Lands

Existing conservation lands fall into two basic categories based on level of protection and the primary protection agency. Over the past year NRPC has been working to create a seamless layer that reflects GRANIT's conservation land data and NRPC data collected over the years. GRANIT's template was used as a foundation for the project. Level of Protection and Primary Protection Agency were the chosen categories for maps based on their importance to the towns in the region. Level of Protection is broken into 5 categories: Permanent Conservation Land, Unofficial Conservation Land, Unprotected Water Supply Lands, Developed Land and Unknown. Primary Protection Agency consists of Federal, State, Municipal/County, Private, and Other Public/Quasi-Public Entity. An in-depth definition of these and other attributes can be found on NH GRANIT's website. Litchfield's existing natural, scenic, historical, and agricultural conservation areas and town owned lands are depicted on **Map 3 - 11**.

In 2002, there were 27 sites identified as protected open space in Litchfield. These conservation parcels are protected as Town lands, public parks, recreational uses, through conservation easements, or through agricultural preservation restrictions. Together these constituted 830 acres or nearly nine percent of Town lands in 2002. Twenty years later there are now 59 conserved parcels of lands which together make up almost 1,300 acres (14% of town lands). That is an increase of 32 parcels, 470 acres, and 5% of town lands which are now set aside for conservation.

The Litchfield State Forest, at 329 acres, is the largest protected area. Permanently preserved open space is concentrated in and around the Litchfield State Forest, near the Merrimack River, and in the Chase Brook Watershed. Table 3-12 identifies conservation lands, the acreage, and the types of conservation mechanism used in Litchfield. The Town has 40 parcels in fee ownership. **Map 3 - 11** illustrates conservation lands in Litchfield.

In recent years, greenway development has become an important open space preservation goal in Litchfield. 'Greenbelts' are swatches of open lands linked in contiguous patterns with the connections between open space providing wildlife habitat and space for public recreation. Greenway corridors enable wildlife migration and often connect larger reservations or different types of natural environments. For example, greenbelts could connect the Merrimack River environment to forested uplands west of Route 3A. The Conservation Commission is promoting a greenway corridor between the Musquash Swamp in Londonderry and the Litchfield State Forest. As noted earlier, 'riparian buffers' provided along a stream provide water resource protection.

Corridors may serve multiple functions and go beyond connecting natural features to joining recreational and cultural sites as well. In all cases, the greater the corridor width, the more adequate it is to wildlife and social uses. The reason why larger buffers are useful is that adjacent land uses encroach on the greenway. A buffer 100 feet from a wetland or conservation feature looks substantial on a subdivision plan, but residential uses may expand their activities into the setback, thereby putting pressure on natural communities and reducing some of the value of the greenway. Developers should be encouraged to provide as much buffering beyond the ordinance requirements as possible. Another way to promote development of greenways could be through the adoption of an open space development overlay zoning district.

Open space in whatever form, fields, woods, or wetlands, is an essential element of Litchfield's environmental character. For maximum environmental advantage, the space able to be set aside is more

effective if it can be contiguous. For instance, the open space fraction of a commercial site should be designed to abut that of an adjoining subdivision or protected open space. Through this mechanism, land would be less fractured. It must be emphasized that land that does not appear to have potential as a part of a greenway should not be dismissed as having low preservation value. Common benefits of greenways are:

1. Protecting ecologically sensitive or endangered corridors and providing important connecting links among reserved areas and ecosystems.
2. Enhancing neighborhood quality of life and creating a greater community “sense of place.”
3. Providing local routes for hiking and other passive forms of recreation.
4. Raising property values and increasing the community appeal to new business sites.

Table 3 - 11: Litchfield Parks and Recreation Areas

Litchfield State Forest (Owned by the State of NH Business and Economic Affairs)	The Litchfield State Forest provides miles of hiking trails. It is accessible from Albuquerque Avenue and Aldrich Street and connects with Londonderry's Musquash Conservation Area.
Roy Memorial Park	Roy Memorial Park is a multi-use complex. It offers softball fields, outdoor basketball courts, playground equipment, a pavilion, open space for soccer and other sports, and fishing and canoeing at Darrah Pond. Talent Hall is also located on the property.
John Bryant River Access	The John Bryant Access provides access to the Merrimack River for canoeing, kayaking, fishing, bird watching, and great river views.
Town Hall Gazebo	Nestled between Litchfield Town Hall and the Bike Path, this park offers a shady stopping point along the bike path.
Litchfield Park at Sawmill Brook	Litchfield Park at Sawmill Brook offers multi-purpose recreation fields and two tennis courts.
Albuquerque Bike Path	The Bike Path offers 6 miles of uninterrupted biking, walking, and jogging opportunities. The bike path connects to many of our parks and trail systems.
Moore's Falls Conservation Area	Moor's Falls Conservation Area offers walking trails to the Merrimack River, bird watching, fishing and great river views. It's a great place to walk the dogs or take the kids for a hike.
Corning Fields	Corning Fields offer two youth baseball fields.
Litchfield Muster Field	The old muster field is across the street from the Historical Society. IT is a good area for bird watching, picnicking, and views of the Merrimack River.
Parker Park	Parker Park offers walking trails along the Nesenkeag Brook to the old trolley bridge. This property does not go to the Merrimack River.
Scott Innes Field	The Scott Innes Field on Brickyard Drive offers multi-purpose fields, primarily used for soccer.
Talent Hall	Talent Hall offers indoor multi-use indoor space, which is commonly used for basketball, pickleball, and other sports.
Birth Street Conservation Area	The Birch Street Conservation Area is 66 acres and provides a trail system that is great for walking, snowshoeing, and cross-country skiing.
Griffin Memorial School Fields	GMS Fields offers multi-use fields, softball and baseball fields, outdoor basketball, and a playground.

Justin Bisset Fields	The Justin Bissett baseball complex offers two baseball fields for the youth of Litchfield.
Campbell High School	Campbell High School offers baseball, softball, and general-purpose fields. These fields are occasionally used by Litchfield youth sports programs.
Litchfield Middle School	Litchfield Middle School is home to the Litchfield Recreational Basketball League. This league typically runs from December through February.

Table 3 - 12: Summary of Conservation Lands in Litchfield

Property Name	Number of Tracts	Acres	Primary Protection Type
Town of Litchfield Land	29	331.7	Fee Ownership
Litchfield State Forest	1	329.4	Fee Ownership
Grassy Pond Management Area – Basin Marsh (Managed by NH DES, Nature Conservancy and Litchfield Conservation Commission)	1	108	Fee Ownership
Airport Mitigation	2	86.7	Fee Ownership
Town of Litchfield Land	5	77.4	Real Estate Development Set Aside Open Space
McElwain - Agric. Pres. Rest.	2	63.5	Agricultural Preservation Restriction
Bixby Meadow	1	60	Fee Ownership
Town of Litchfield Land	2	45.5	Conservation Easement
Large White Lot	1	44.5	Fee Ownership
Moore's Falls Conservation Area	1	33.3	Conservation Easement
Calawa/Landay - Agric. Pres. Rest.	2	31.3	Agricultural Preservation Restriction
White Lot	1	22.6	Fee Ownership
Larchmount Open Space	1	19	Real Estate Development Set Aside Open Space
Merrimack River Atlantic Salmon Smolt RS	1	18.7	Real Estate Development Set Aside Open Space
Duck Pond Lot	2	12.2	Fee Ownership
Merrimack River Boat Access	1	7	Fee Ownership
Sherburne Lot	1	6.5	Fee Ownership
Rocky Hill Pond Lot	1	4.2	Fee Ownership
Parker Park	1	3.1	Fee Ownership
Garden Dr FEN	1	2.8	Fee Ownership

Property Name	Number of Tracts	Acres	Primary Protection Type
Town of Litchfield Land	1	0.1	Right of Way
Totals	59	1,299.8	

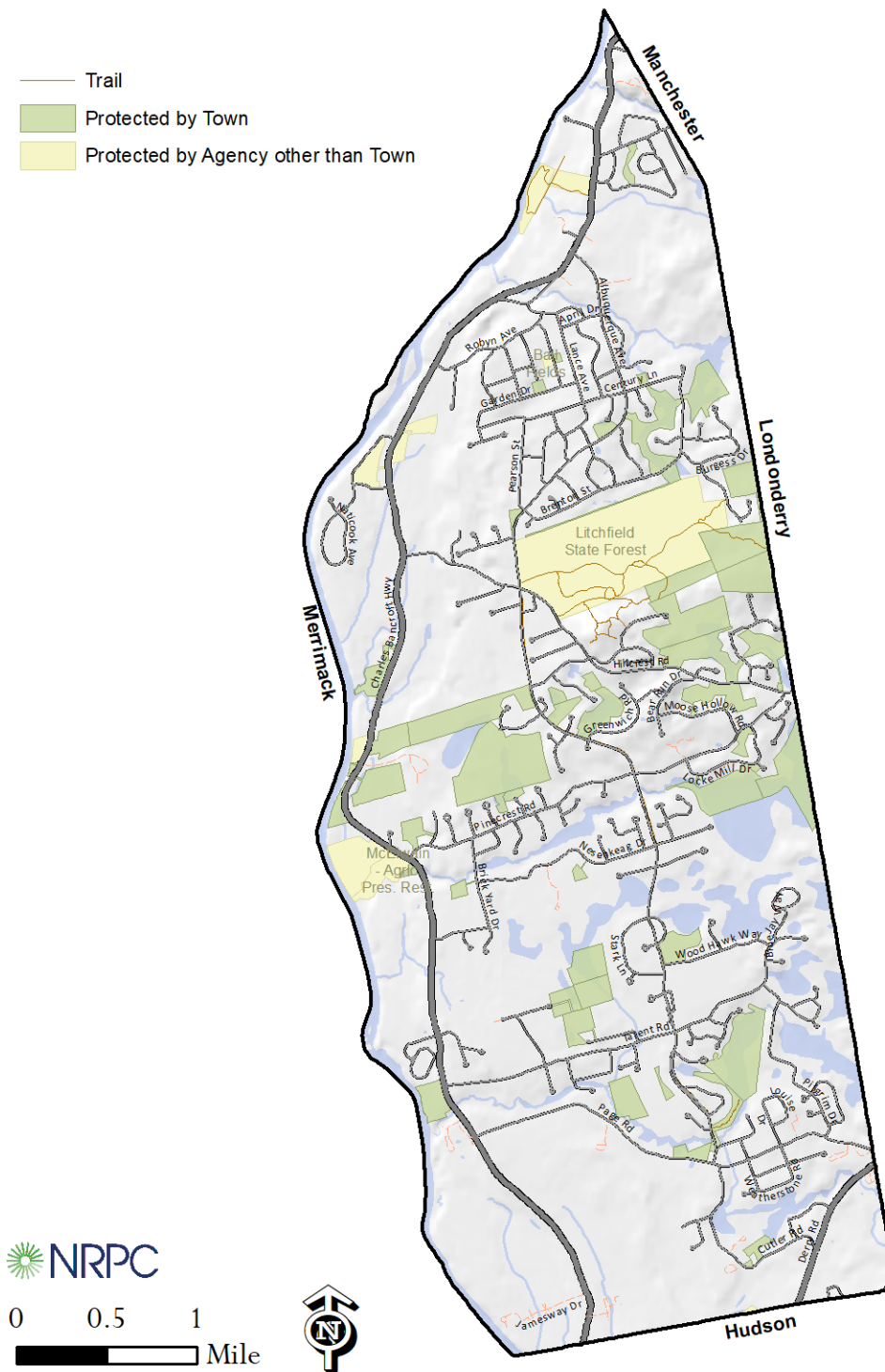
Data Sources: Conservation Tracts: NPRC GIS database 2021

Table 3 - 13: Land Cover Change from 2001 to 2019 in Litchfield

Type of Land Cover Change	Acreage of Change	Percentage of town land
No change	8472.72	86.53%
Water	45.81	0.47%
Urban	943.14	9.63%
Wetland within class	110.30	1.13%
Herbaceous wetland	2.89	0.03%
Ag hay/pasture	25.35	0.26%
Cultivated crop	24.24	0.25%
Hay/pasture	12.23	0.12%
Barren	79.39	0.81%
Forest-theme	90.29	0.92%
Woody wetland	0.44	0.00%

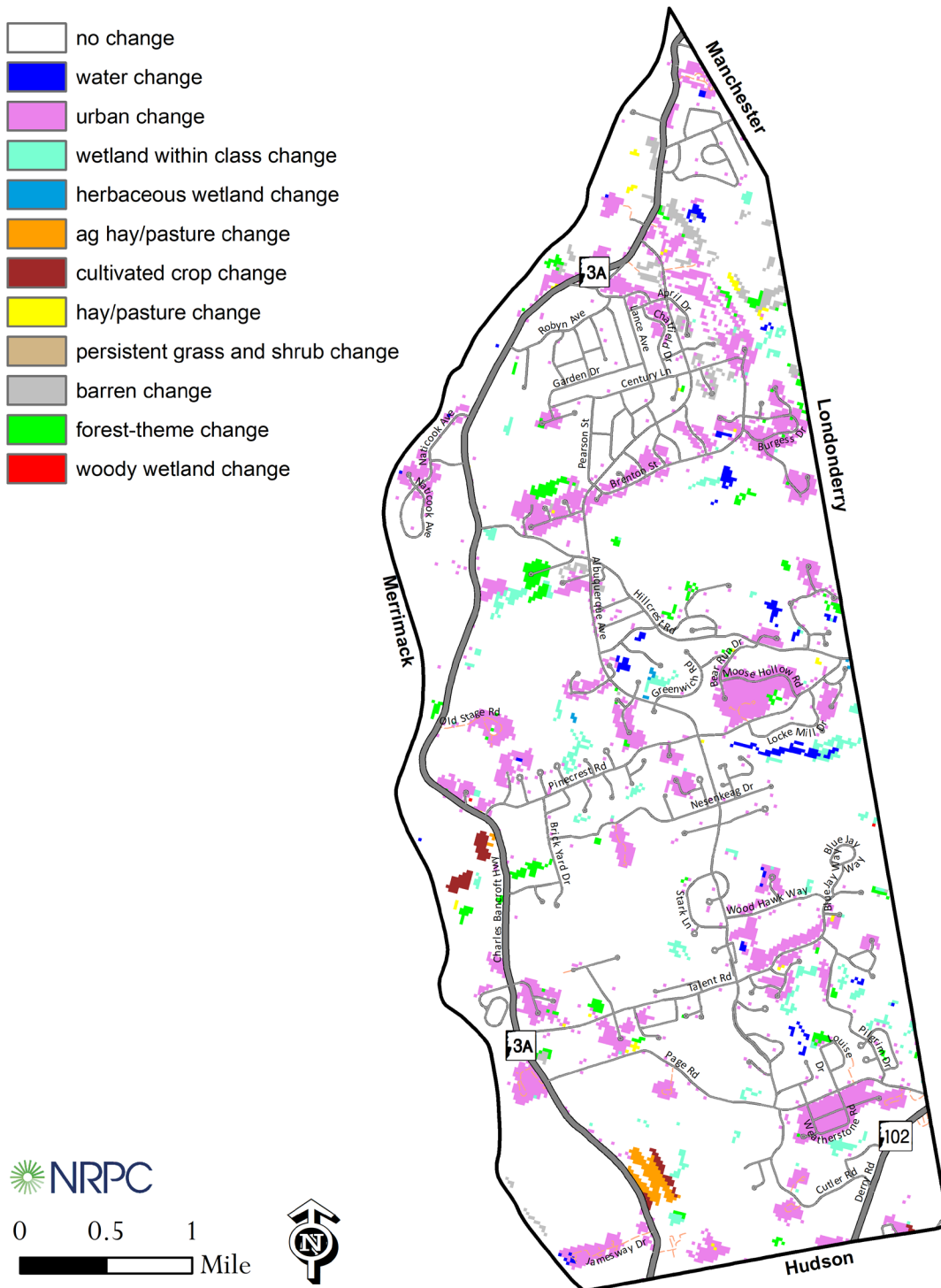
Data Source: National Land Cover Database (NLCD) Land Cover Change Index (CONUS) 2001-2019.

Map 3 - 11: Conservation Lands




Data Sources: Trails, Conservation Tracts: NRPC GIS database 2021

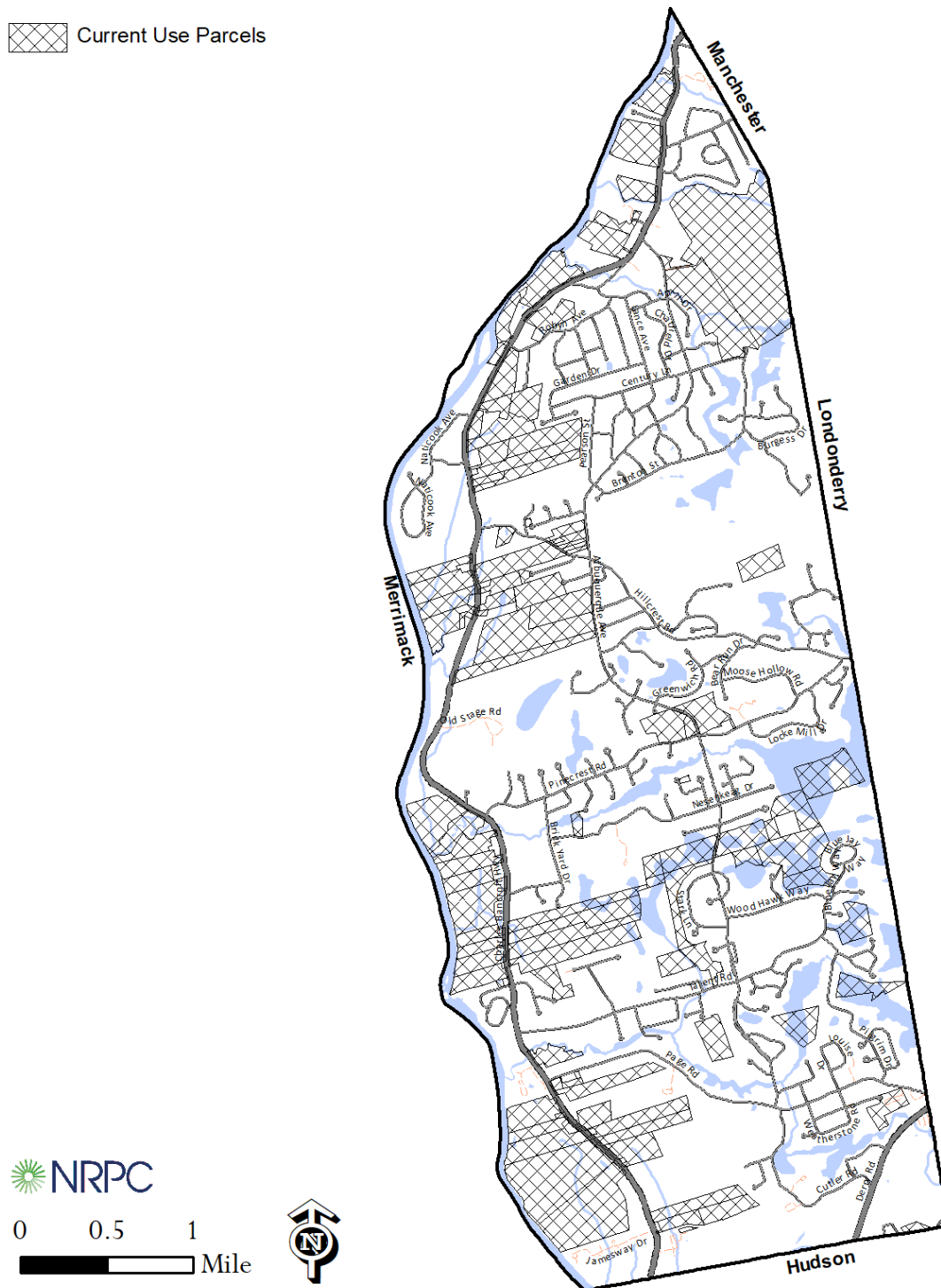
Map 3 - 12: Land Use Change from 2001-2019



Data Source: National Land Cover Database (NLCD) Land Cover Change Index (CONUS) 2001-2019.

Map 3 - 13: Current Use

 Current Use Parcels



Data Source: Litchfield Assessing Database December 2021.

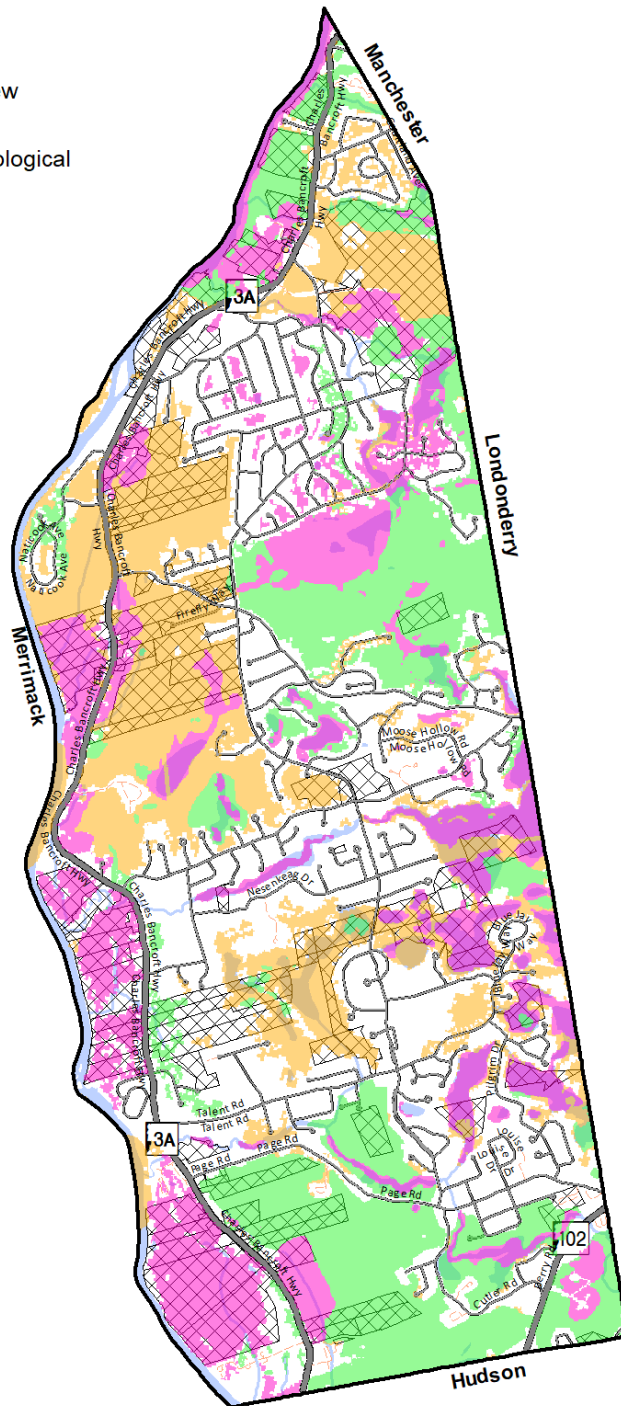
Map 3 - 14: Current Use Parcels and Priority Habitats

Priority Habitat

-  1 Highest Ranked Habitat in New Hampshire
-  2 Highest Ranked Habitat in Biological Region
-  3 Supporting Landscapes
-  Current Use Parcels



0 0.5 1
Mile



Data Source: New Hampshire Fish and Game Wildlife Action Plan (WAP) 2020, Litchfield Assessing Database December 2021.

Table 3 - 14: Current Use Lands in Litchfield

Land Use Category	Current Use Type	Sum Of Acres
Permanent Open Space	FARMLAND	1
Two Family Residential	FARMLAND	1.75
Vacant	FARMLAND	17.18
Commercial	FARMLAND	18.4
Mixed Use	FARMLAND	19.7
Single Family Residential	FARMLAND	24.58
Agricultural	FARMLAND	256.908
Vacant	MNGD HARDWD	2
Vacant	MNGD OTHER	1
Single Family Residential	MNGD PINE	1
Vacant	MNGD PINE	78.9
Two Family Residential	UNMNGD HARDWD	1.009
Permanent Open Space	UNMNGD HARDWD	16
Single Family Residential	UNMNGD HARDWD	43.228
Vacant	UNMNGD HARDWD	77.007
Permanent Open Space	UNMNGD OTHER	1
Two Family Residential	UNMNGD OTHER	2.2
Multi-Family Residential	UNMNGD OTHER	8.346
Commercial	UNMNGD OTHER	15.5
Agricultural	UNMNGD OTHER	15.7
Single Family Residential	UNMNGD OTHER	24.296
Industrial	UNMNGD OTHER	94.324
Vacant	UNMNGD OTHER	107.526
Single Family Residential	UNPRODUCTIVE	0.882
Industrial	WETLANDS	15
Vacant	WETLANDS	31.191
Single Family Residential	WETLANDS	52.966
Total		928.593

Data Source: Litchfield Assessing Database December 2021.

F. Scenic and Historic Resources

Litchfield's river environment attracted prehistoric populations for thousands of years. The area has been actively studied by archaeologists and is considered one of the most important archaeological locations in New Hampshire. 17th through 19th century settlers similarly found the floodplains flanking the Merrimack River well suited for agriculture and trade. European settlers left their mark through farmhouses and agricultural buildings. Historic resources that remain along Rt. 3A help define the

town's rural character. Often taken for granted by those accustomed to the appearance of the 3A corridor, the farmhouses, farm buildings, town center and open space along the road present a strong image to tourists and residents of neighboring communities - some of whom live in areas that have lost their traditional appearance in recent years in the face of rapid development. The preservation of manmade resources and cultural heritage is fundamental to the retention of a sense of place, identity, and continuity in Litchfield.

Litchfield is the home of some of the best archaeological sites in the state and has held the attention of amateur and professional antiquarians and archaeologists for over 100 years. Indigenous cultures were supported by the riverfront environment, which provided readily exploitable resources, including fish, migratory birds and diverse flora and fauna. Following two small excavations in Litchfield in the 1970s by the New Hampshire Archaeological Society, archaeological investigations in the early 1980s located more than 30 Indian sites, many intact, yielding artifacts ranging from 9,000 to approximately 300 years old.

Map 3 - 15: Historic and Archaeology Sites

Historic and Archaeological Sites

- Archaeological Site
- Historic Site

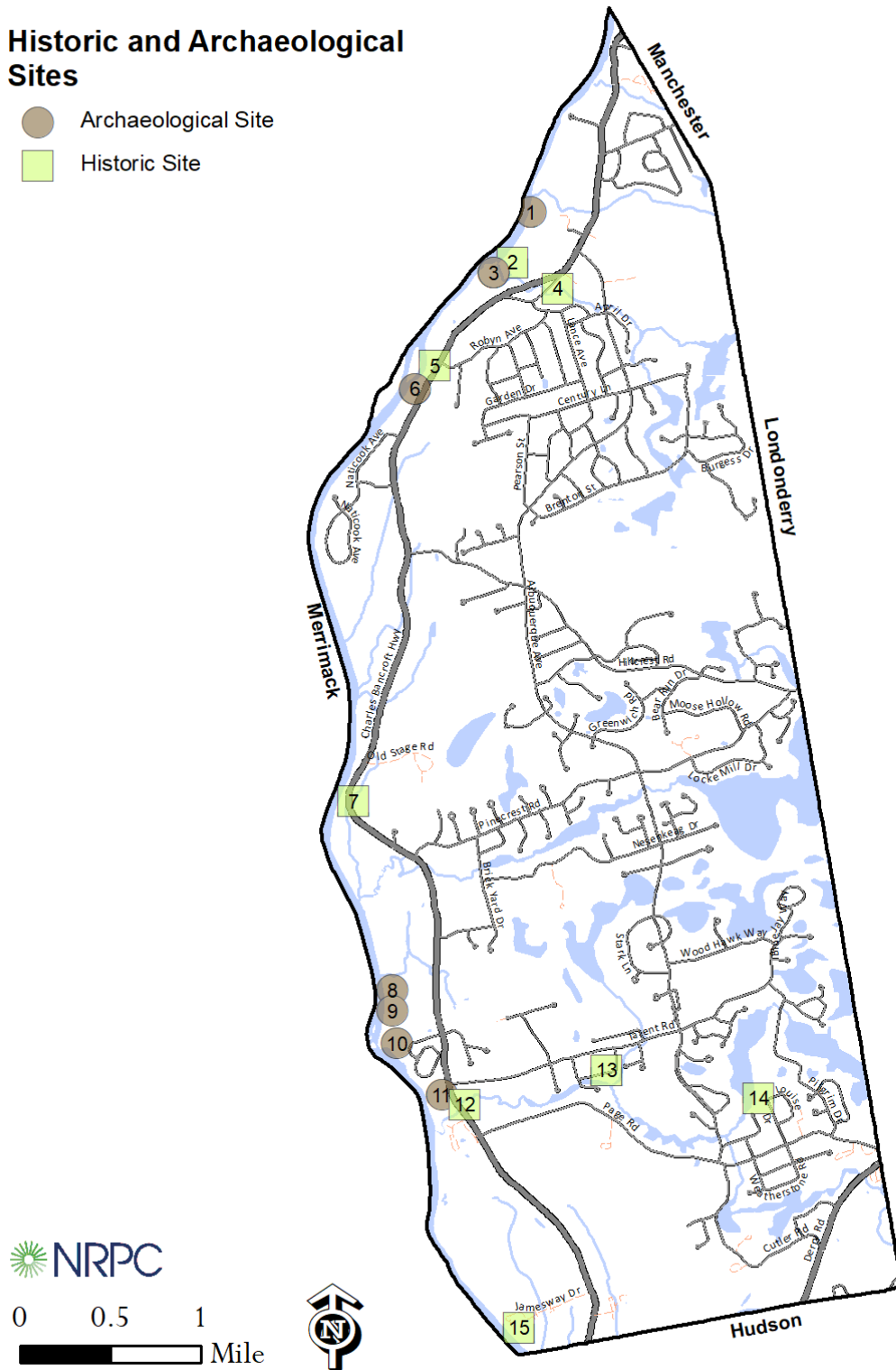


Table 3 - 15: Historic and Archeology Sites

MAP NUMBER	SITE TYPE	NAME	DESCRIPTION	SOURCE
1	ARC	Three Flakes Site	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
2	HIS	Moore's Falls Locks	Three locks provided a bypass to the longest rapids on the Merr River system	Merrimack River Corridor Management Plan
3	ARC	Litchfield Sites	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
4	HIS	Grist Mill	Remains of Local Grist Mill on Colby Brook	Merrimack River Corridor Management Plan, 1989
5	HIS	Century Farm	Litchfield's most substantial late 18 c house, example of the Georgian style	Merrimack River Corridor Management Plan 1989
6	ARC	Rodonis Field Site	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
7	HIS	Litchfield Town Center	Collection of early civic structures	Merrimack River Corridor Management Plan 1989
8	ARC	Nesenkeag Site	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
9	ARC	Smolt Site	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
10	ARC	Campbell Site	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
11	ARC	Thibodeau Site	Prehistoric Archaeological Site	Lower Merrimack River Corridor Management Plan
12	HIS	Grist Mill	Site contains remains of an old grist mill	Merrimack River Corridor Management Plan, 1989
13	HIS	Poor Farm	Selected by 1991 Master Plan	1991 Master Plan
14	HIS	Old Brickyards	Site of Old Brickyards identified by 1991 Master Plan	1991 Master Plan
15	HIS	Danforth Archaeological District	Remnants of old trolley line abutments visible	Merrimack river Corridor Management Plan 1998

Map 3 - 15 illustrates Litchfield's archeological sites, which have been investigated, as well as other historic sites in the Town. Two sites in particular: the Thibodeau Site, north of Chase Brook, and the Danforth Archaeological District in south Litchfield, are considered especially significant. The Environmental Impact Statement (EIS) for the Circumferential Highway project¹ concluded that these sites are eligible for listing on the National Register of Historic Places because they contain information important to the understanding of prehistory along the lower Merrimack Valley and possibly New England.

A visual survey of town bears out that the greatest concentration of significant historic resources are within the 3A corridor. The main public road connecting Litchfield with Manchester and Hudson was laid out in 1734 and its alignment has changed little, as evidenced by the proximity of buildings to the road. Running the length of town, this road is the spine along which homes and services were historically oriented. Litchfield differs from other towns in the region in its extreme linear development, contrasting with the typical New England town common or village concept.

One of the oldest surviving structures in town is believed to be the Alves House. Although it has been greatly altered, its roofline still suggests its First Period origins. Research indicates it was built in 1766, but some timbers are believed to date back to a late 1600s house previously on the property. More substantial and more intact late 18th Century houses include the Jean House and Sordillo House, the latter known as "Century Farm." Many of the earliest houses display little ornament; decoration is usually reserved for the doorway. Fanlit doorways, such as that on the Sparks House, are typical of the Federal style and are relatively rare in Litchfield. Judging from the number of cornerblock doorway moldings, inspired by the Greek Revival style, there was considerable building activity in the 1830s and '40s, a period at which Litchfield's commercial trade was at its height, prior to the point when the negative impact of the railroad passing by Litchfield in favor of Merrimack was felt. Buildings constructed during this period and retaining features of the period include the Goffe House, Robinson House, Besse House and Chamberlain House.

¹ Army Corp of Engineers, *Nashua-Hudson Circumferential Highway Final Environmental Impact Statement*, Volume I, 1993.



The old town hall was built in 1851 from parts of an older Meeting House, which was built across the road from where the building now stands. A shift in the course of the Merrimack River during the early 1800s forced the dismantling of the original Meeting House. The adjacent Community Church was built in 1844. These two structures, together with the town Library, Cemetery and half a dozen surrounding residences constitute the only real town center in Litchfield. In

the vicinity of this historical town center area were also the locations of Thornton's Ferry, where people received passage across the river, and the colonial period muster grounds where regional troops assembled for the Crown Point campaign. According to an interview with a Historical Society official in spring 2000, the muster grounds are identified by State Officials as one of two colonial era muster grounds in New Hampshire that remain in an undeveloped condition.



Other than the town center, there are few significant concentrations of historic resources in Litchfield. Rather, individual historic structures and cellarholes indicating previous areas of habitation are scattered throughout town, particularly along the old River Road (now NH 3A) including some small concentrations of human activity by the sites of former dams, mills, and brickyards. A listing of some of the town's more important historic structures and sites is illustrated in **Map 3 - 15** and **Table 3 - 15**, above.

Scenic views of farmland, forests, wetland, and the river valley go hand in hand with the town's built historic resources and should be considered significant cultural resources in their own right. Open spaces as well as buildings should be considered landmarks worthy of preservation in Litchfield. In addition, a unique natural resource mentioned in Henry David Thoreau's journals were glacial sand dunes in the vicinity of Pinecrest Cemetery.

G. Government Regulations

This section of the Plan discusses the federal, state, and local regulations that pertain to the protection of the Town's natural, agricultural, historic and scenic resources. It is important for the Conservation Commission and the Town's citizens to be aware of these regulations to facilitate the identification and the reporting of potential violations. Enforcement of the numerous regulations is an unwieldy task, therefore, the state, federal and local agencies need all of the assistance they can get from the citizenry to stop violations and ultimately protect the resource.

Federal and State Regulations

Clean Water Act

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredge and fill material into the Nation's waters, including wetlands. The CWA requires all dredge and fill activities to obtain a permit from the US Army Corps of Engineers prior to commencing the activity. Exempted activities include normal agricultural, silviculture and ranching activities, construction of farm, forest or temporary mining roads and maintenance of existing structures such as dams, dikes, and bridges. Permits are also not required if an area is non-tidal and has a flow of less than 5 cubic feet per second if it is not a tributary to a navigable water and if it is less than one acre in size.

Fill and Dredge in Wetlands

New Hampshire RSA 482-A, Fill and Dredge in Wetlands, establishes the New Hampshire Wetlands Board as the administrative agency responsible for regulating activities in the State's wetlands. The Board reviews all applications to excavate, dredge, fill or construct a structure in or on the wetlands and surface waters of the State. The jurisdiction of the Wetlands Board overlaps that of the Corps under section 404 of the CWA, however, the Wetlands Board regulates a broader range of activities with no allowable statutory exemptions.

The provisions of the statute allow conservation commission intervention into the review of the applications by the Wetlands Board. This avenue should be utilized by every conservation commission to ensure consideration of local issues and concerns by the Wetlands Board. To obtain additional time for review of the application the commission must give written notification to the Wetlands Board that it wishes to investigate the application within 10 days of the application filing date.

Water Pollution and the Disposal of Wastes

Section 404 and its State counterpart, NH RSA 149, prohibit the pollution of surface and groundwater resources through the discharge of point and non-point sources of pollutants. State waters are classified based on water quality and maximum acceptable pollutant concentrations as established by the Environmental Protection Agency (EPA). Point sources of pollution are required to obtain a National Pollution Discharge and Elimination System (NPDES) permit that specifies wastewater treatment practices, effluent monitoring and the minimum effluent standards for the permit. The NH Department of Environmental Services (NHDES) is the State agency charged with implementing RSA 149, permitting activities and enforcing the regulations.

Rivers and Harbors Act of 1899 (Federal)

Section 10 of the Rivers and Harbors Act regulates dredge and fill activities in navigable waters of the Nation. Under this section, the Chief of Engineers approval is required for any construction activities, such as building of docks and piers, dredging or filling, in navigable waters. Navigable waters are defined as tidal waters or larger rivers and lakes that are presently, have been in the past or may be in the future, used for water borne commerce.

Safe Drinking Water Act (Federal)

The purpose of the Safe Drinking Water Act is to ensure a safe public drinking water supply that poses no problems or health threats. The Act requires testing of public water supplies for regulated and unregulated contaminants regulates underground injections of potential contaminants and requires states to establish wellhead protection for public water supplies. In order to provide safe public water supplies, towns are required to have water treatment plants or to develop alternate groundwater sources as is the case in Litchfield. The provisions of the Act are administered by the Department of Environmental Services (DES). DES is also responsible for analyzing water used for swimming and drinking, licensing of youth recreational camps and certification of water work for operators and laboratories conducting water analyses.

Dams and Hydropower Facilities

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. Before licensing, dams for hydropower projects must receive the necessary permits from other State and Federal agencies and conform to the safety and

construction requirements of the DES Water Division. The Water Division, as the state agency responsible for dam safety, regulates construction of new dams, inspects existing publicly and privately owned dams, and maintains state owned dams. The only way to ensure that a river will not be dammed, at this point, is to have it designated as a Federal Wild and Scenic River. Wild and scenic river designation prohibits the use of any federal funds for the construction of a project that might adversely affect the river. In effect, this eliminates dams and diversions which require federal approval. <http://www.ferc.gov/about/ferc-does.asp>

Public Utilities Commission

The New Hampshire Public Utilities Commission (NHPUC) is vested with general jurisdiction over electric, telecommunications, natural gas, water and sewer utilities as defined in RSA 362:2 for issues such as rates, quality of service, finance, accounting, and safety. It is the NHPUC's mission to ensure that customers of regulated utilities receive safe, adequate and reliable service at just and reasonable rates.

National Flood Insurance Program (Federal)

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to decrease the damage and economic loss of flooding. The NFIP requirements apply to areas mapped as Special Flood Hazard Areas (SFHA) on Flood Insurance Rate Maps (FIRMs) issued by FEMA. Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

<http://www.fema.gov/flood-zones>

Resource Conservation and Recovery Act (Federal)

The Resource Conservation and Recovery Act (RCRA) as administered by EPA regulates the generation, transportation, treatment, storage and disposal of hazardous wastes, solid wastes and underground storage tanks. RCRA requirements are the responsibility of the DES and are handled primarily by the Waste Management Division (WMD). The underground storage of hazardous raw materials and petroleum products is regulated by DES through the oil pollution control program. NH RSA 149-M requires solid waste facilities of all sorts to obtain a permit from the WMD in order to operate.

<http://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act>

<http://des.nh.gov/organization/divisions/water/>

Funds for the cleanup of hazardous waste disposal sites are provided by the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or "Superfund". The State of New Hampshire established a hazardous waste cleanup fund in 1981 to provide money to clean up non-qualifying CERCLA hazardous waste sites. The fund is administered by the Waste Management Division. In addition, DES provides funds to conduct household hazardous waste cleanup projects on a dollar-for-

dollar matching basis with the participating municipalities or other local or regional organizations. The Litchfield Recycling Center has participated in this program.

<http://des.nh.gov/organization/divisions/waste/hwrb/>

Toxic Substances (Federal)

The EPA regulates the manufacture, distribution, and use of chemical substances under the Toxic Substances Control Act of 1976. The manufacture, distribution and use of pesticides is regulated by EPA under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA, 1996). The Office of Pesticide Programs (OPP) regulates the manufacture and use of all pesticides (including insecticides, herbicides, rodenticides, disinfectants, sanitizers and more) in the United States and establishes maximum levels for pesticide residues in food, thereby safeguarding the nation's food supply.

<http://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act>

Endangered Species Act (Federal)

The Federal Endangered Species Act requires protection of critical habitat for endangered or threatened species. The Federal Endangered Species List contains 245 mammals, fish, birds, insects, reptiles, crustaceans, and plants. The NH Endangered Species conservation Act, RSA 212-A, prohibits the taking, possession, transportation, or sale of any endangered or threatened species. The Fish and Game Department is responsible for animal species while the Department of Resources and Economic Development (DRED) is responsible for plant species.

<http://www.fws.gov/endangered/laws-policies/>

Significant Alteration of Terrain Permits

In conjunction with the Wetlands Board, DES reviews and permits dredge, excavation, fill, mining, transportation of forest products and construction activities to be located in or on the border of the State's surface waters defined as any ponds or lakes greater than 10 acres in size. In addition to this, DES in 1981 adopted additional regulations under the authority of RSA 149: 8-a, that require permits for construction or earth moving activities that would disturb an area of 100,000 contiguous square feet or more regardless of location. The purpose of the regulations is to control water pollution that may result from increased runoff and alteration of drainage patterns.

Sewage Disposal Systems

Subdivisions with lots of less than 5 acres not serviced by public water and sewer must obtain a subdivision approval by NH DES. In addition, the design, construction, and operation of any septic or other subsurface wastewater disposal system must be approved by NH DES. Septic tanks and leach fields are required to have minimum setback of 75 feet from surface water, open drainage areas, private wells, reservoirs, and neighbor's foundations. The minimum setback is 200 feet from community wells and 400 feet from municipal wells. These represent only a few of the most important minimum setbacks established in the rules. In addition, these minimum setbacks are established as minimums. The individual municipalities have the authority to adopt more stringent standards governing septic system design and installation.

Cutting of Timber near Public Waters

New Hampshire RSA 227-J:9 regulates the cutting of timber near public waters and public highways. The statute restricts cutting to no more than 50% of the basal area of trees to be cut within 150 feet of any great pond (ponds or lakes larger than 10 acres), navigable river or public highway or within 50 feet of any

perennial stream, brook, or river without a permit from Department of Resources and Economic Development (DRED).

In addition, logging operations must comply with other statutes such as needing a Wetlands Board permit for permanent or temporary roads crossing perennial or intermittent streams. Also, the Intent to Cut form contains an agreement to conduct the operation using the appropriate best management practices to prevent surface water pollution. In one location in the State, timber cutting followed by heavy rain forced the closure of the Town's public water supply for a week because of sediments.

Motorboat Operating Restrictions

The NH Division of Safety Services is responsible for boating safety in the fresh waters of the State. Speed, horsepower, and propulsion restrictions for boats on fresh water are established by the Legislature. In addition, NH RSA 270:12 allows these same restrictions to be set by the Commissioner of Safety if petitioned by 25 or more persons, by any association with 25 or more members, or by any governmental subdivision of agency. Therefore, any restrictions on motorboat use on the Town's ponds would require legislative action.

Rivers Protection and Management Plans

The New Hampshire Rivers Management and Protection Program, NH RSA 483, allows any NH organization or resident to nominate a river or a segment of a river for protection by submitting a description of the values and characteristics of the river.

National Register of Historic Places

The National Register of Historic Places is the official federal list of properties with local, state and/or federal significance in the areas of American history, architecture, archaeology, engineering, or culture. Properties may be nominated for National Register status by any organization, individual or district. Once the application form is completed, it is submitted to the NH State Historic Preservation Office for review by the State Review Board. Following approval at the State level, the application is forwarded to Washington for final approval and listing. To qualify for listing in the National Register, properties or districts must meet the evaluation criteria in the Federal Regulations summarized below:

The significance in American history, architecture, archaeology, engineering, and culture in districts, sites, buildings, structures, and objects that possess the integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- a) That area associated with events that have made a significant contribution to the broad patterns of our history; or
- b) That are associated with the lives of persons significant in our past; or
- c) That embody the distinctive characteristics of a type, period, or method of construction; or
- d) That represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- e) That have yielded or may be likely to yield information important in prehistory or history.

National Register listing is beneficial in that it may spark interest and appreciation in the community's historic resources; provides for review and amelioration of impacts for federally funded or assisted

projects; ensures eligibility for tax credits for the rehabilitation of historic buildings; and qualifies for federal preservation grants when funding is available. Listing in the Register does not interfere with the owner's right to alter, manage, dispose of or even demolish his property unless federal funding is involved. Therefore, National Register listing does not ensure the continued unaltered existence of the historic resource. Hence, additional protection mechanisms are needed to preserve the remnants of the past for the generations of the future.

Local Regulations

This section will discuss the mechanisms available at the local level for protecting the natural, agricultural, scenic, and historic resources of the community. The Town of Litchfield is already using the powers provided through local regulatory authority to protect and manage its community resources. Direct measures have been taken to protect wetlands and aquifers through the adoption of a Wetlands Conservation District and an Aquifer Protection District. In addition to the direct mechanisms, many of the Town's regulations provide indirect benefits to natural resources, such as the minimum setbacks from wetlands, excluding wetlands to be included as buildable area in calculating minimum lot size, provisions for clustering to preserve open space, and requiring the maintenance of natural drainage patterns to name only a few. The Town of Litchfield is doing a good job protecting its natural, agricultural, scenic, and historic resources and is encouraged to continue in its efforts to protect the resources of the community and preserve the rural character and charm of the Town.

Zoning

Zoning is the major power available to localities in managing land use and development. In addition, the State has provided for local subdivision review regulations, nonresidential and multi-family site plan review and historic districts. Other mechanisms for land use management at the local level include scenic road and prime wetland designations.

After adoption of the general statement of objectives and the land use sections of the Master Plan, towns are granted the power to zone by RSA 674:16 "for the purpose of promoting the health, safety or the general welfare of the community..." This power includes the right to adopt innovative land use controls such as phased development, cluster development, performance standards, flexible and discretionary zoning and environmental characteristics zoning (NH RSA 674:21).

Zoning is used to establish the appropriate locations for types and classes of land use in the municipality and to establish specific requirements for land uses and structures. One stated purpose of zoning is to "assure the proper use of natural resources..." (NH RSA 674:17). Conservation zoning is used to protect areas sensitive to development based upon the protection of public health, safety, and general welfare. Conservation districts are generally overlay districts which apply additional conditions to the underlying zone. Examples of conservation districts include wetlands districts, floodplain districts, aquifer districts, steep slope districts and watershed districts to name a few. The Town of Litchfield already has adopted wetland, floodplain, aquifer, and watershed protection districts to protect the public welfare and the resource.

Subdivision Review Regulations

Towns can adopt subdivision review regulations regardless of whether or not they have adopted a zoning ordinance. Regulated areas relative to conservation include the provision of "adequate open space"; the provision of parks of adequate size and suitable location for playgrounds and other

recreational purposes; requirements that the land be buildable without posing any health hazards; and minimum lot sizes in conformance with the zoning and appropriate areas for septic systems (NH RSA 674:36). Subdivision regulations can be used to promote conservation of natural, historic, and cultural resources located in the community. Litchfield's Subdivision Regulations provide direct and indirect protection for the Town's natural resources. For example, wetlands and floodplains are excluded from the buildable area of a lot in considering minimum lot size; a soil erosion and sedimentation control plan is required for all subdivisions except minor subdivisions; leach fields must be set back a minimum of 100 feet from open waterbodies and perennial streams; high intensity soil surveys are required for all subdivisions except minor subdivisions. These provisions represent only a few of the requirements that directly or indirectly relate to preservation of the Town's natural, historic, agricultural, and scenic resources.

Site Plan Review

Municipalities may review nonresidential or multi-family development under the authority of NH RSA 674:43 if the town already has zoning and subdivision regulations and upon adopting site plan review regulations. The site plan review regulations may contain provisions for ensuring adequate storm water drainage, pollution control measures, the quantity and quality of surface and groundwater, the protection of natural land features such as wetlands and steep slopes, adequate amounts of open space and landscaping in keeping with the surrounding character of the community. As in the case with the Litchfield Subdivision Regulations, Litchfield's Site Plan Review Regulations provide direct and indirect protection of the Town's resources. For example, the Site Plan Review Regulations require the preparation of a storm water drainage plan. This requirement is designed to ensure the proper handling of storm-water runoff so that it doesn't cause problems with erosion and sedimentation or drainage on the site as well as on abutting properties. Additional requirements are similar to those mentioned in the previous section which achieves the same benefits of resource protection.

Historic Districts

Localities are granted the authority to establish Historic Districts under NH RSA 674:46. Within the District, localities have the authority to regulate the construction, alteration, repair, moving, demolition or use of such structures and places. The Historic District Commission is responsible for conducting the research to serve as a legal basis for the district, adopting regulations governing change and development in the district and enforcing the ordinance. Historic district designation can provide protection for historic structures and places of historic and architectural value beyond those provided by National Register listing. It is important to emphasize that historic district commissions control noncontributing structures as well as new construction within a district. Alterations and additions within a district are individually reviewed with respect to their mass, scale and detailing in relation to surrounding structures. The success of any local historic district depends on a variety of factors including local support and the ability and commitment of the Town to enforce the regulations.

Excavation

Municipalities are given the authority to regulate excavation activities under RS a155-E. All excavation activities require a permit from the Planning Board except for those specifically exempted in the Statute. The following excavation activities are exempted from the permitting process:

1. Activities incidental to lawful construction or alteration of buildings and parking lots;

2. Activities incidental to agricultural or silvicultural activities or normal landscaping;
3. Excavation for a granite quarry if permitted by the zoning ordinance; and

In addition, the statute prohibits permitting the following projects:

1. Excavation within 50 feet of the property line of an opposed abutter or within 10 feet of an approving abutter;
2. Excavations not permitted by zoning or other applicable ordinance;
3. Where issuance of the permit would cause undue hazards or injuries to the public welfare;
4. Where existing visual barriers near public highways would be removed;
5. Where the excavation would substantially damage a known aquifer;
6. When the excavation requires land use permits from state or federal agencies; but the regulator may approve the application when all necessary land use permits have been obtained; and
7. Where the project cannot comply with the restoration provisions of the statute.

The statute also contains provisions for restoration of the excavation site within 12 months after the expiration of the permit. The restoration must meet minimum conditions for vegetative cover to retard erosion based on soil type; debris from the excavation must be buried or removed; natural slopes must be maintained based on the soil type; and any standing bodies of water resulting from the excavation must be eliminated. These are the minimum standards based on the statute. Municipalities can choose to develop and adopt more stringent standards if they so desire.

Additional Local Protection Mechanisms

Prime Wetlands

In order to designate any of its wetlands as prime, a town must first conduct a wetlands inventory in accordance with the rules of the Wetlands Board. Based on the evaluation conducted in the inventory, those wetlands determined to be of high value can be brought to town meeting for designation as prime wetlands. Upon approval, the wetlands maps and designations can be filed with the Wetlands Board. Permit applications for activities in designated prime wetlands will be more closely examined for potential impacts.

The Conservation Commission is responsible for notifying the Wetlands Board when a proposed activity involves or is adjacent to a prime wetland. Upon verification, a public hearing will be ordered and held by the Wetlands Board who will then make the final decision on the application. If approved, the permit will have an effective date 28 days after the decision to allow for appeal. Though prime wetlands designation does not guarantee protection, it does ensure a more detailed review of the permit application and a closer scrutiny of the potential impacts of the proposed activity.

Voluntary Mechanisms

A number of land protection mechanisms exist that are self-imposed by the landowner. These techniques are often more effective and binding than regulation measures available to localities. The techniques currently in use range from acquisition of a parcel through purchase or donation of an

easement to current use tax assessments and restrictive covenants. The available techniques will be briefly discussed below.

Current Use Assessment

The current use assessment program, authorized by NH RSA 79-A, allows for reduced property assessments on parcels of field, forest, farm, and wetland of 10 acres or greater, on "natural preserve" land or recreation land of any size and on active farmland of any size with at least a \$2500 annual gross value of product. Applications to the program are conducted through the assessors or the selectmen and are due by April 15. Upon approval of the application and acceptance into the program the assessed valuation of the property will be lowered to the level prescribed by the program. Removal from the program or a change to a non-qualifying land use results in a 10% land use change tax based on the assessed full value at the time of the change and applied to that tax year.

Parcels less than 10 acres may qualify for a discretionary easement. The program requires the land holder to give the easement to the Town for a minimum time period of 10 years. During that time the landowner cannot develop, subdivide or otherwise intensify the use of the tract. Application is done through the Planning Board in April who makes a recommendation to the selectmen on acceptance of the easement. Once accepted the easement is registered and early removal or a change in land use would result in a penalty, however, no penalty would result if the time contract is met.

Acquisition

Fee simple ownership of a parcel is the best method available to assure its protection. Outright purchase of a parcel is the most expensive method and very often beyond the means of the Conservation Commission, and the Town. In addition, town-owned property represents a decrease in the tax base which may further hinder the process of acquisition. The efforts of private non-profit conservation organizations are also hampered by a lack of funding for land purchases, however, alternatives to fee simple purchase do exist.

Donation

Donation is the simplest and least expensive method of acquiring land for protection. The donor is assured long-term protection of the land and relieved of the property taxes. Contributions to qualified charitable organizations would also provide some federal income tax deductions.

An outright donation of full title and ownership of the property is the most direct method, and it provides the maximum tax benefits. A bequest in a will is another form of donation. While this method ensures long-term protection and a reduced estate tax, it does not provide any immediate tax benefits such as property tax relief and charitable deductions. A third form of donation is donation of a remainder interest. This involves the immediate donation of the property; however, the donor reserves the right to its use for the remainder of his or some other specified family members' lifetime. The tax deduction for this type of donation is based on the remainder of the full market value minus the lifetime use of the property. Thus, the donor would receive a present benefit less than that of an outright donation but greater than a bequest.

Thus, there are several alternatives available to a landowner wishing to protect the future use of his land through donation. The benefits and costs of each type should be thoroughly discussed with the landowner prior to the donation.

Bargain Sales

A bargain sale is an alternative to a donation and an outright purchase. A bargain sale allows a conservation organization to purchase a parcel of land at less than full market value and the owner can take a charitable federal deduction for the difference between the sale price and the full market value. This technique allows organizations to acquire total ownership of the property at a lower cost while still allowing the landowner to receive some compensation.

Conservation Easements

Conservation easements are authorized by NH RSA 477:45-48. A conservation easement places permanent restrictions on the use of the property. This allows the landowner to maintain ownership while protecting the property from development. The terms of an easement are flexible and can be tailored to the desires of the landowner. The restrictions of the easement are perpetual and binding on all future landowners.

Donation of the easement to a charitable organization entitles the donor to a charitable federal income tax deduction for the reduced value. The IRS has established a set of criteria outlining the type of conservation easements that qualify as charitable deductions. Compliance with these criteria is important if the landowner is seeking a charitable income tax deduction. The organization receiving the easement is responsible for enforcing the conditions of the easement and therefore must establish a regular monitoring program and provide for potential legal enforcement.

Easements are often used to encourage good forest and agricultural management ensuring the continuation of the existing land use.

Purchase of Development Rights

Purchase of a conservation easement is called purchase of development rights. This involves acquiring the rights for certain land uses on a parcel in less than fee simple. This action allows the landowner to receive a monetary compensation greater than a tax deduction. This technique is often used to protect prime productive agricultural lands from conversion to a different use.

Options and Rights of First Refusal

An option establishes the price at which an organization can purchase the land during a specified period of time. This guarantees the purchase price while allowing the organization the time it needs to raise the money. The process works in the following manner. First the landowner and the organization establish a purchase price for the parcel. Second, a deadline is established, and the owner agrees not to sell the property to any other party during that time period. The organization then uses the time to raise the money necessary for the purchase. If the money is not raised by the deadline, the owner is free to sell the property to another party. If it is raised, then the group proceeds with the purchase of the property at the agreed upon price.

A right of first refusal is less specific than an option in that it simply guarantees the conservation group the opportunity to purchase the land at a price equal to a bona fide offer. A conservation organization would obtain a right of first refusal from a landowner in the event that he wished to sell his property at some time in the future. The landowner then receives an offer from another individual for the property. The conservation organization then has the option to match the offer or to negotiate the purchase at a lower price before the property is sold. A right of first refusal is less binding than an option; however, it does afford some legal means for conservations organizations to acquire land.

Both of these options give the conservation organization the time necessary to raise the money for purchase of the property. In neither instance is the organization obligated to purchase the property.

Restrictive Covenants

A covenant is a written agreement between two or more parties in which each pledge to the other that something will or will not be done. An example would be a lake association whose members agree to leave a buffer strip along the shore of the lake. The covenant passes with the land to future owners and is enforced by the parties to the agreement. Covenants are generally difficult to enforce and may be nullified in court if deemed outdated or no longer appropriate.

Deed Restrictions

Deed restrictions provide an option to the landowner to place restrictions on the use of the land for a given period of time. The deed may state the allowed agricultural use and prohibit the subdivision or development of the property for a specified time. The longevity of the deed restriction is up to the landowner.

H. Funding Sources

Most conservation commissions do not have large budgets for purchasing conservation lands. Therefore, it is necessary for them to obtain funding from one or a combination of other sources or to work in conjunction with other conservation organizations. Competition for the limited funds available for land conservation is intense so it is important to be aware of all the alternatives. The following sections will briefly identify funding sources and programs at the federal, state, and local level.

Federal Funds

The Land and Water Conservation Fund (LWCF) is a federal fund administered by the NH Division of Parks and Recreation a division of the Department of Resources and Economic Development. The fund pays up to 50% of the appraised fair market value for the purchase of conservation and recreation lands by governmental units. The remaining 50% is to come from the locality, private sources or it may be donated by the landowner. Municipalities, school districts and the State are eligible recipients of the fund. As is the case with most federal programs, appropriations to the Land and Water Conservation Fund have been declining.

Funds are distributed through a competitive application process. Each section of the application is assigned a point value and these points are totaled at the end of the review procedure. Applications are then ranked in order of the number of points received and those with the most points receive funding.

The New Hampshire Fish and Game Department receives federal funds under the Pittman-Robertson, Dingell-Johnson and Wallop-Breaux Acts for land acquisition. These funds pay 75% of the appraised fair market value of land purchased by the Department to provide public access to ponds and rivers, wildlife habitat, fish and game management areas and critical habitat for endangered or threatened species. All Fish and Game lands are open to the public for hunting, fishing, and other recreational activities not in conflict with the management goals.

State Funds

The Land and Community Heritage Investment Program (LCHIP) was enacted by the state legislature with broad bi-partisan support in 2000 for the purpose of providing competitive grants for land conservation and historic preservation projects that permanently protect iconic landscapes and historic

structures in the Granite State. The purpose of making these investments is to strengthen the social and natural resource fabric of local communities and to enhance the local and regional economies in the State that depend on tourism.

The original goal was to provide \$12 million a year in state funds through LCHIP to leverage at least as much in non-state funds to make these conservation projects possible. Since 2000 LCHIP has made 240 grants to projects in 141 New Hampshire communities totaling \$27 million. These grants have protected over 260,000 acres of land and conserved 142 historic structures. The LCHIP grants have leveraged nearly \$8 of non-state funding for every dollar awarded. The largest LCHIP grant helped to permanently conserve one private ownership of 146,100 acres of working forest land in the towns of Pittsburg, Clarksville, and Stewartstown, at the State's northern tip.

Between 2000 and 2008 general funding for LCHIP was very erratic, and far below the initial goal of \$12 million a year. Consequently, the legislature established a dedicated fund for LCHIP in 2008, creating a \$25 recording fee on deeds, mortgages and plans at the State's 10 county registries of deeds. The fee was projected to raise about \$6 million a year and was specifically dedicated to the LCHIP fund. Once again, state budget pressures led to legislative diversions of this dedicated fund (from 2009 to 2012) to non-LCHIP purposes. In June 2013, the Governor and Legislature adopted a comprehensive state budget that left the LCHIP dedicated fund in place, without any raid or diversion. The fund raised \$4.1 million for the year ending June 2014 and is projected to raise \$4.3 million in the year ending June 2015.

<https://www.forestsociety.org/advocacy-issue/land-and-community-heritage-investment-program-lchip>

Local Funds

The Conservation Commission may have funds that it may use to acquire property or easements for conservation purposes. These funds may come from the municipal budget or from some other source. The Town may also vote to appropriate funds for the purchase of lands that are deemed significant and important to the entire community. A fund-raising effort in the community could also be used to raise funds for the acquisition of an area whose conservation is important to the Town.

Private Funds

Another alternative to public funding sources and acquisition is the acquisition of the area by a private organization. These organizations are generally private, non-profit, land-holding conservation organizations. Most of the conservation organizations have limited budgets for purchasing land and easements; however, if the parcel is significant enough an arrangement can usually be made.

Conservation organizations active in New Hampshire include: the Audubon Society, the Society for the Protection of New Hampshire Forests and the Nature Conservancy.

Chapter V: Litchfield Conservation Commission Priorities for Natural Resource Management and Recommendations for Action

The previous sections of the Conservation Plan have focused on identifying the Town's natural, historic, agricultural, and scenic resources and the Federal, State and local regulations designed to protect those resources. This section of the Plan focuses on evaluating the protection needs of the resources and is designed to assist the Conservation Commission in making decisions and to provide for effective and efficient use of its limited resources.

The Conservation Commission understands it would be impossible to preserve all of the open spaces and resources of the Town. Realizing this, they have tried to identify the most significant assets of the community, those important to maintaining the character of the Town.

1. Conserve Prime Agricultural and Habitat Resources
2. Create Corridors for Wildlife Habitat Protection
3. Preserve Scenic and Unique Natural Resources for Outdoor Exploration
4. Preserve Key Historic Sites in the Community
5. Preserve the Quality of Surface Waters and Groundwater for the Future

The Town of Litchfield is concerned about its natural resources as is evidenced by the regulations already adopted, the Conservation Open Space Development, the Floodplain Conservation District, the Wetlands Conservation District, the Aquifer Protection District, and the various other direct and indirect protection mechanisms contained in the other sections of the zoning ordinance. The Town's commitment has also been demonstrated by its funding for the development of a Conservation Plan, and on-going updates to the current Master Plan.

In an effort to continue preserving key natural, historic, agricultural and scenic resources, the following recommendations have been identified. These recommendations will assist in achieving the goals and objectives established for the Litchfield Conservation Plan and identify the group(s) responsible for carrying out these actions.

Local Land Use Controls

Zoning is the major avenue available to a town for protecting its natural resources. Zoning is a low-cost, effective mechanism for protecting a dispersed resource such as a wetland or a floodplain. The Town of Litchfield has adopted a number of regulations providing direct protection for many of its natural resources while other regulations provide indirect benefits. While the existing regulations provide adequate protection for many of the Town's resources, some minor adjustments to the existing regulations would increase the level of protection afforded to the Town's natural resources. The following recommendations address proposed changes in the Town's zoning ordinances.

1. Extend the Well Protection Radius to 100 Feet. It is recommended to also extend the well protection radius to 100 feet in order to promote adequate separation of wells and sanitary waste disposal and promote public health. Natural Resources Chapter, Master Plan

2. Promote Tree Retention in Subdivisions and Commercial Developments. Natural Resources Chapter, Master Plan
3. Shoreline Protection. A local shoreline program should be considered for adoption as part of the zoning ordinance and fashioned after the state model shoreline protection ordinance. Natural Resources Chapter, Master Plan
4. Encourage the use of innovative land use controls including conservation/open space development, growth boundaries, agricultural zoning, and transfer of development rights are techniques available to preserve open space and minimize the visual impact of new development on significant historic areas, open space, and scenic views. Natural Resources and Historic Resources Chapter, Master Plan
5. Regulate tree clearing on new development, to promote retaining undamaged trees or planting new trees as needed. Simply having mature hardwood trees on the south side of a house will reduce the winter heating costs and summer cooling costs by 10%. Leaving trees around residences also reduces the area devoted to lawns, and the impacts of fertilizers, pesticides, and watering. Trees also help residences blend into the landscape. Natural Resources Chapter, Master Plan
6. Amend the Wetland Conservation District to include a minimum 75 foot setback, measured horizontally, with a 50 foot vegetative buffer strip for all site developments from the edge of the wetland. A minimum 75 foot setback will decrease the velocity of the runoff and allow portions of the runoff to infiltrate into the ground before reaching the wetland. The 50 foot buffer strip will filter out contaminants, nutrients and sediments decreasing the negative impacts on the wetland and preserving its natural functions. Water quality will be enhanced and the lower degree of activity adjacent to the wetland will decrease the negative impacts of human activities on the wildlife.

Some of the recommendations outlined above require an amendment to the existing Zoning Ordinance or the development of new regulations. To accomplish these recommendations the Conservation Commission should work with the Planning Board to develop the necessary amendments and regulations in a joint effort. In addition to the specific recommendations for changes to the Zoning Ordinance, the following general recommendations are made regarding the powers of development review and to ensure continued monitoring of the impact of growth and development on the natural resources of the community.

1. The Conservation Commission with the assistance of the Planning Board should continually monitor development in the Town. This will allow an analysis of the cumulative impacts of growth and development on water quality and the other natural, historic, scenic, and agricultural resources of the community. Urban development increases the amount of impervious area resulting in increased runoff and an increased potential for flooding and water contamination. In addition, development can reduce the amount of agricultural land remaining in a community and profoundly impact the scenic quality and character of the Town.

2. The Planning Board should continue to use its powers of subdivision review and site plan review to assess the impact of proposed developments and to negotiate design changes with developers that would protect the Town's natural, scenic, historic, and agricultural resources.
3. The Planning Board should negotiate, through the subdivision and site plan review process, to obtain conservation and public access easements to parcels prior to development of a site, upon the request and input of the Conservation Commission. The conservation easements can be used to protect the natural, historic, and scenic resources contained on a site. The public access easement is necessary to allow public use of or passage across a site. This is a particularly important consideration along the Merrimack River for developing the greenbelt and for developing any additional trail systems.
4. Provide Neighborhood Recreation Opportunities – During development review, the Planning Board should promote park dedications and public access to lands adjacent to new development. Examples of needs are: open fields, ball fields, picnic tables and trails. Neighborhood-level facilities enhance community development and provide play space close to home or work. These parks should not be substitutes for higher-order town-wide facilities. Community Facilities Chapter, Master Plan

Federal and State Regulations

As indicated in Chapter III, there are numerous state and federal regulations with jurisdiction over local land use activities. It is important that the Town's governing bodies, boards and citizens be aware of these regulations in order to utilize them to their fullest extent and ensure compliance.

1. The Conservation Commission should consider developing a brief description of the state and federal regulations that relate to land use activities. The list should contain the appropriate agency to contact in case of a violation. Citizens should be encouraged to report any suspected violations to the appropriate agency. There are numerous available resources that could be linked to the website.
2. The Conservation Commission should join forces with other commissions and conservation organizations to lobby the legislature to increase the penalties for violations of state environmental laws and strengthen enforcement. Under the existing penalty structure, penalties are often not severe enough to ensure compliance with the law.

Acquisition

While federal, state, and local regulations can be used to provide an adequate level of protection for the majority of the Town's natural resources, there exist some resources where regulation is inadequate or inappropriate. In these instances, acquisition is the most effective mechanism available for ensuring the long-term protection of the resource. Fee simple acquisition of the parcel may not be necessary. The purchase of development rights or easements may be all that is required to protect the resource. Based on this, the following recommendations are made for acquiring easements or fee simple ownership of key parcels in the Town.

1. The Conservation Commission should develop a Land Acquisition Plan with a prioritized list of parcels for future development.

2. Protect Farmland. The Town should evaluate if funds set aside for agricultural lands protection and preservation are comparable to the high priority it is assigned. Officials may want to develop policies to provide additional tax incentives for maintaining large blocks of active agricultural land. Natural Resources Chapter, Master Plan
3. The Town should pursue the purchase of development rights or easements to the most significant agricultural lands in the community. This acquisition is important to assure the continuation of agriculture and to maintain the character of the Town. In addition, the preservation of agricultural lands will generally provide multiple benefits by protecting other resource areas located on the parcel, such as viewsheds and habitats.
4. The Conservation Commission should pursue open space acquisition. Continue to inventory natural systems and identify the most important ecological habitat, contiguous tracts, and key linkages. It is important to emphasize that viewsheds are a natural resource and form an important part of community character; thus, there should also be attention to these resources in long-range environmental planning and during development review. Natural Resources Chapter, Master Plan
5. The Conservation Commission or Town should actively seek funding for the purchase of conservation lands or easements.
6. The Conservation Commission should continue to seek funding, from the Town in the annual budget, for conservation land and easement acquisitions. The information gathered in this plan and any additional available information should be used to support the Conservation Commission's request for funding to the Budget Committee. The Conservation Commission needs to make a strong presentation to the Budget Committee and CIP Committee to obtain their support. In addition, the Conservation Commission needs to continually keep the citizens informed about the increase in growth and land use changes within the Town to gain their support for funding conservation purchases.

Education

Education is important to the success of the Conservation Plan in general and essential to many of the individual components. The Town's citizens need to be aware of the immediate and cumulative impact of their action on the natural, scenic, historic, and agricultural resources of the community. In addition, the town meeting form of government makes it necessary for voters to be informed of resource related issues in order to gain their support of conservation efforts and for approval of regulations designed to protect and conserve the Town's resources. The primary responsibility for conservation education lies with the Conservation Commission. It is their job to see that the community is well informed about the conservation issues of the Town. The following recommendations are made to increase public education activities in the Town, thereby increasing public awareness of conservation issues and public support of conservation efforts.

1. The Conservation Commission should provide materials on the website and in person if opportunities arise, to educate town residents on a variety of topics such as:
 - Protection of water resources and water conservation;

- Impacts of non-point pollution on water quality and what can be done to decrease non-point pollution on an individual basis;
- Management of small forest areas for such purposes as tree harvesting, wildlife and multiple use;
- Conservation mechanisms available to private landowners and the benefits of the different alternatives;
- The care and maintenance of septic systems.

Information and speakers for these programs can come from a variety of organizations such as the County Forester, the Natural Resources Conservation Service, the Society for the Protection of New Hampshire Forests and the NH Audubon Society, to name only a few.

2. The Conservation Commission should utilize the power of the press to its fullest extent. This can be accomplished by encouraging the press to write articles focusing on conservation measures and practices and to report on Conservation Commission activities. In addition, the Conservation Commission can write letters to the editor expressing concern for the protection of the Town's resources or in support of state legislation, local regulations, and town meeting warrant articles.
3. The Conservation Commission should prepare one or more pamphlets identifying the existing recreational and conservation lands available to the public. Trail networks, river access points, historic resources, etc., should be highlighted. The pamphlets should be available at the Town Office and the Library. This activity will get people interested in the recreational and conservation activities of the Town and provide additional support to the Conservation Commission.
4. The Conservation Commission should serve as a resource to local boards and committees such as the Planning Board, Zoning Board and Board of Selectmen.
5. The Conservation Commission should maintain relevant materials and resources on the Town website. In addition, the Commission should look for opportunities to educate the public via social media and other media outlets.
6. The Heritage Commission should promote historical interest and pride, as well as the continued collection, preservation, and protection of early photographs. Ways to promote awareness are:
 - photographs and exhibits in public places;
 - brochures describing local history;
 - lectures on local history;
 - tours of historic structures and sites;
 - local history courses in the school curriculum;
 - oral history projects;
 - support of the Litchfield Historical Society; and
 - taking pictures of townspeople and structures for permanent reference. Natural Resources Chapter of the Master Plan.

Conservation Commission

Towns are authorized to create Conservation Commissions by NH RSA 36-A. The statute also lists specific responsibilities of the Conservation Commission along with additional activities the Commission may undertake. The list of responsibilities includes:

1. Develop a Natural Resource Inventory for the Town.
2. Coordinate the activity of unofficial bodies organized for similar purposes;
3. Maintain an index of the Town's natural and scenic resources;
4. Keep accurate records of its meetings and actions.

In addition, the Conservation Commission may do the following:

1. Recommend to the Selectmen a program for the protection, development and sound utilization of all the areas in the index;
2. May acquire in the name of the Town by gift or purchase to whatever degree necessary the right to conservation lands within the Town and be responsible for the management and control of the acquired area; funds for purchasing conservation areas may be carried over from year to year;
3. Provide public information on conservation issues.

Many of the components of this plan are designed to fulfill the responsibilities of the Conservation Commission as established by statute. First, the Commission conducted an inventory of the Town's natural, scenic, agricultural and forest resources. Second, the identified resources were indexed and ranked in order of need for protection. Third, the proposed land use monitoring system would assist in maintaining the index and provides the necessary information for supporting a conservation program. And fourth, the Plan outlines a program for the Conservation Commission to provide public information to the Town's residents.

In order for the Conservation Commission to accomplish the goals and objectives for the Plan it is recommended that:

1. The Conservation Commission examine alternative sources of financing as outlined in the Plan for the purchase of full or partial right to conservation lands.

Historical Society and Heritage Commission

The Historical Society and Heritage Commission can provide a great deal of information about the historic resources of the Town. In addition, they are the organizations involved in promoting and protecting the historical resources and heritage sites of the Town. Therefore, the Conservation Commission needs to work jointly with the Historical Society and Heritage Commission to conserve the historic resources of the community. The following are from the HISTORIC RESOURCES CHAPTER of the Master Plan.

1. Encourage continued archaeological investigation in Litchfield, particularly along the brooks and associated floodplain that feed into the Merrimack River, and which have not been studied in

detail, as well as along 3A where much of the recent history evolved. One reason that investigation is an important first step is that without it there may be a lack of awareness regarding key resources and sites.

2. Continue to locate, identify, and catalogue sites of historical significance and identify the highest priorities for preservation. Analyze resource types, the significance of sites, the imminence of threats to resources, and the opportunities for preservation. Analyzing resources now could place the community in a competitive position to receive grant funds when these are available.
3. Continue the protection and enhancement of the historic Litchfield center. The residential, agricultural, and public service character should be retained. This area could potentially serve as a boundary or gateway for a town-center or village zoning district to the north and west, which could extend as far as the Liberty Way municipal complex.
4. Obtain copies of documents and studies that identify and assess archeological and historical resources from the New Hampshire Division of Historical Resources. Obtaining this information and making it available to the public at the local level will facilitate the systematic sharing of information on cultural and historical resources.
5. The Town should encourage the protection, enhancement, and rehabilitation of significant architectural and historic resources such as the Town Hall and the library. Any building changes, site improvement or other alteration (especially to town owned buildings) should respect the historical qualities of the structure. Similarly, if renovation is proposed for the fire station on 3A, efforts should occur to improve the façade appearance so the structure better blends in with the historic buildings adjacent to it.
6. Encourage National Register listing for eligible local structures, such as the town center and appropriate private residences.
7. Continue to locate, identify, catalogue, preserve and protect town records, documents, manuscripts, and artifacts and provide a suitable and safe repository for them. Early handwritten records should be reproduced (transcribed or microfilmed but not photocopied) and copies kept in more than one location. Continue to make collected historical information (in a protected environment) accessible to town residents and future generations.
8. Promote the donation of easements by historic property owners to a designated authority such as the Conservation Commission, The Society for the Protection of New England Antiquities, or an established land trust such as the Society for the Preservation of New Hampshire Forests. Where appropriate, the Town should consider applying for assistance from the Trust for New Hampshire Lands acquisition and easement program.
9. Promote upgrading, preservation and protection of Town graveyards and private burying grounds.

Litchfield Recreation Commission

1. Develop a Formal Recreation Plan - Based on a demonstrated difficulty keeping up with the anticipated demand for athletic facilities, a recreation plan should be produced for the community. The plan would provide detailed comprehensive analysis and recommendations on

how to plan, implement and manage recreational facilities over the next ten years. Community Facilities Chapter, Master Plan

2. Develop High-Order Town-Wide Recreation Opportunities in a Central Location – Impact fees and exactions should be used to enhance and expand the Town’s central facilities. Future growth will significantly increase the overall demand for recreational offerings. Community Facilities Chapter, Master Plan
3. Merrimack River Access should feature prominently in local planning. The demand for boating, fishing, and pedestrian recreation will increase as the Town grows and water quality improves. River access is complementary to farmland and open space preservation, although careful planning should occur to ensure that the uses remain compatible. Community Facilities Chapter, Master Plan
4. Provide Locally for Regional Recreation – Litchfield should explore how its recreation offerings influence the livability of the region overall. Developing local trails will help link Litchfield recreation enthusiasts with resources that extend outside of the community and will help foster types of recreation that extend across municipal boundaries. Community Facilities Chapter, Master Plan

Planning Board & Zoning Board of Appeals

The Planning Board is responsible for drafting new zoning ordinances, amending existing ordinances and, along with the Zoning Board of Adjustment, administering the Town's land use regulations. Many of the recommendations proposed in the Plan require the Planning Board to amend existing or draft new zoning regulations. It is important that the Planning Board understand the reasons for amending the existing and developing new regulations to conserve the Town's natural resources. Therefore, it is recommended that:

1. The development of the amendments and the new ordinances be a joint effort between the Planning Board and the Conservation Commission.
2. The Planning Board work toward increasing communication with the Conservation Commission.
3. The Planning Board publicly support the recommendations of this Plan and the conservation efforts of the Conservation Commission.
4. The Planning Board use this Plan to develop the Natural Resources chapter of the Town's Master Plan.
5. The Planning Board support providing funding to the Conservation Commission for the purchase of conservation areas in the annual Town budget.

Board of Selectmen

The Board of Selectmen is the decision-making body for the Town. Therefore, it is important to have the Board's support for the Conservation Plan and the efforts of the Conservation Commission. Most of the existing State and Federal conservation programs and funding sources require the signature and support of the Board as the Town's representatives. Therefore, it is important that the Conservation Commission develop a strong working relationship with the Selectmen to ensure cooperation in obtaining

conservation areas and the timely conveyance of information concerning conservation efforts. In addition, it is the Board of Selectmen that will be contacted regarding any problems associated with the development of the greenbelt or other public access areas. Therefore, they need to be assured that the day-to-day problems of public use of the area can be adequately dealt with and that they have been considered in the continuous planning for the area.

Budget Committee

The Town budget is prepared by the Budget Committee. Therefore, it is essential that the Conservation Commission educate the Budget Committee concerning the need for conservation of the Town's natural resources in order to obtain funding for their efforts. Though the Committee does not have final approval over the budget, their support of a program is important. The Conservation Commission can use the information contained in this Plan and the information obtained in the monitoring program to illustrate the need for including funding for conservation purchases in the annual Town budget.

Natural Resource Conservation Service

The Natural Resource Conservation Service (NRCS) can provide the Conservation Commission with a great deal of valuable information. They can assist the Conservation Commission in evaluating impacts to wetlands; they will conduct site visits to evaluate wetlands and soils characteristics; they can provide general educational information concerning soil capabilities and agricultural practices; as well as numerous other types of assistance and information. The NRCS is also a good source of speakers and information for the Town discussions and the information pamphlets.

Private Conservation Organizations

There are several private conservation organizations active in New Hampshire. These include the Society for the Protection of NH Forests, the Audubon Society, the New England Forestry Foundation, the Piscataquag Land Conservancy, the Society for the Protection of New Hampshire Forest, the Nature Conservancy, the Russell Farm and Forest Conservation Foundation, the Monadnock Community Trust, the Monadnock Conservancy, the Harris Center for Conservation Education and Beaver Brook Association. All these organizations are actively involved in obtaining conservation lands and easements. The Conservation Commission should be aware of these organizations, their policies, and programs. Each of these organizations could provide invaluable information on conservation techniques, funding sources and establishing a conservation program and organization.

Cooperative Extension

The NH Cooperative Extension is another agency from which the Conservation Commission can obtain resource information. The Extension can assist the Conservation Commission by providing information and speakers for the Town discussions and the information pamphlets.

Nashua Regional Planning Commission (NRPC)

The Nashua Regional Planning Commission (NRPC) can assist the Conservation Commission and the Town with numerous activities. NRPC staff can provide expert advice on developing regulations for protecting the Town's resources since the NRPC has extensive experience in developing ordinances. NRPC has developed a handbook to assist Towns in conducting a community tank census to identify underground storage tanks. Another recently completed publication focuses on the issues surrounding

the use of impact fees. In addition, NRPC staff can assist the Conservation Commission with applications for funding and in conducting an inventory of its historical resources.

[Lower Merrimack River Local Advisory Committee \(LMRLAC\)](#)

The Merrimack River has been designated as a protected river due to its outstanding natural and cultural resources. The Lower Merrimack River Local Advisory Committee formed in 1990 after the Lower Merrimack received designated status. Under RSA 483 Local River Management Advisory Committees are appointed for each designated river or segment. Activities of the Committees vary from reviewing wetland applications and site plans for development, to assisting with trail projects and commenting on conservation activities within the river corridor.

[New Hampshire Office of Energy and Planning \(OEP\)](#)

The OEP maintains a significant on-line resource library with a vast array of topics that could be an excellent reference for the Conservation Commission.

<https://www.nh.gov/oep/resource-library/subject-list.htm>

<https://www.nh.gov/oep/resource-library/land-use/index.htm>

