

CHAPTER VII: NATURAL RESOURCES

1 INTRODUCTION

General overview of assets

- Forest Resources
- Water Resources
- Physical Geography/Topography
- Agricultural Resources
- Cultural Features and Recreational Resources

The economic, cultural, public safety and health benefits of environmental protection are increasingly being quantified in economic and social measures that show them to bring significant values to human society.

Community Goals Summary (survey and public workshops):

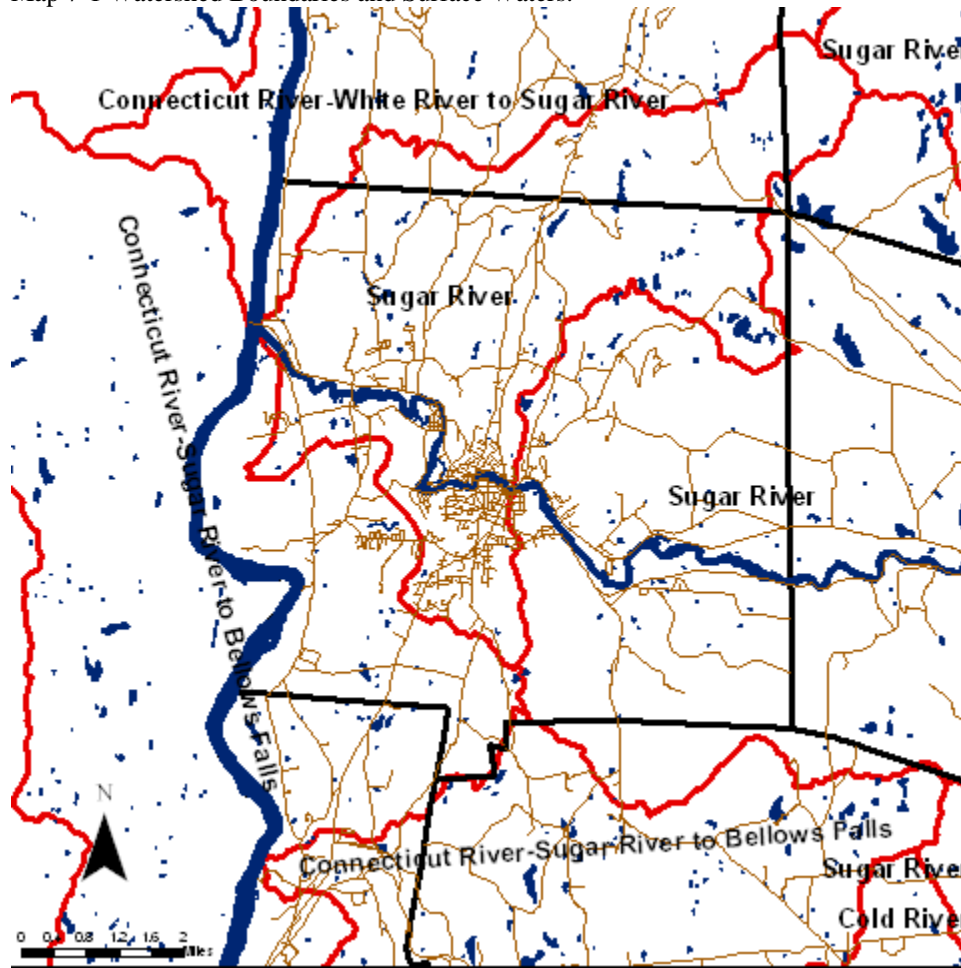
- Natural Resources Inventory
- Recreational Resources
- Open and Forested Areas
- Public Access to Water and Trails
- Conservation and Wildlife Protection
- Scenic Resources

This chapter provides an overview of Claremont's natural environment that includes its open spaces, watersheds, water bodies, potential drinking water supplies, wildlife, forests, and the public access to these resources.

WATER RESOURCES

All of Claremont is within the Connecticut River watershed and most of it is within the Sugar River watershed. As rain and snowmelt travel within this "catch basin" and flow by gravity into the water bodies and ground, they carry various amounts of nutrients and pollutants with them. A watershed approach to water resources planning is critically important, as watersheds are the main units of surface water and groundwater recharge. In addition, the land uses located within a watershed directly impact the water quality.

Map 7-1 Watershed Boundaries and Surface Waters.



1.1 Surface waters

The Comprehensive Shoreland Protection Act, RSA 483-B, protects 6 water bodies in Claremont. The Connecticut River, and the Sugar River are perhaps the most prominent, but, Chapin Pond, Coy Paper Dam, Rice Reservoir, and Whitewater Brook are important as well from both a water quality and wildlife habitat standpoint.

1.2 Wetlands

Wetlands are areas where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands include such areas as swamps, bogs, fens, floodplains and shorelands. Wetlands must have the following three attributes:

1. At least periodically, the land supports predominantly water loving, or hydrophytic plants;
2. The substrate is predominantly poorly drained hydric soil; and
3. The substrate is saturated with water or covered by shallow water for at least fourteen days during the growing season each year.

The value of wetlands for groundwater and stream recharge, flood attenuation, pollution abatement, and wildlife habitat is still little understood and vastly under-appreciated. Wetlands function as natural water

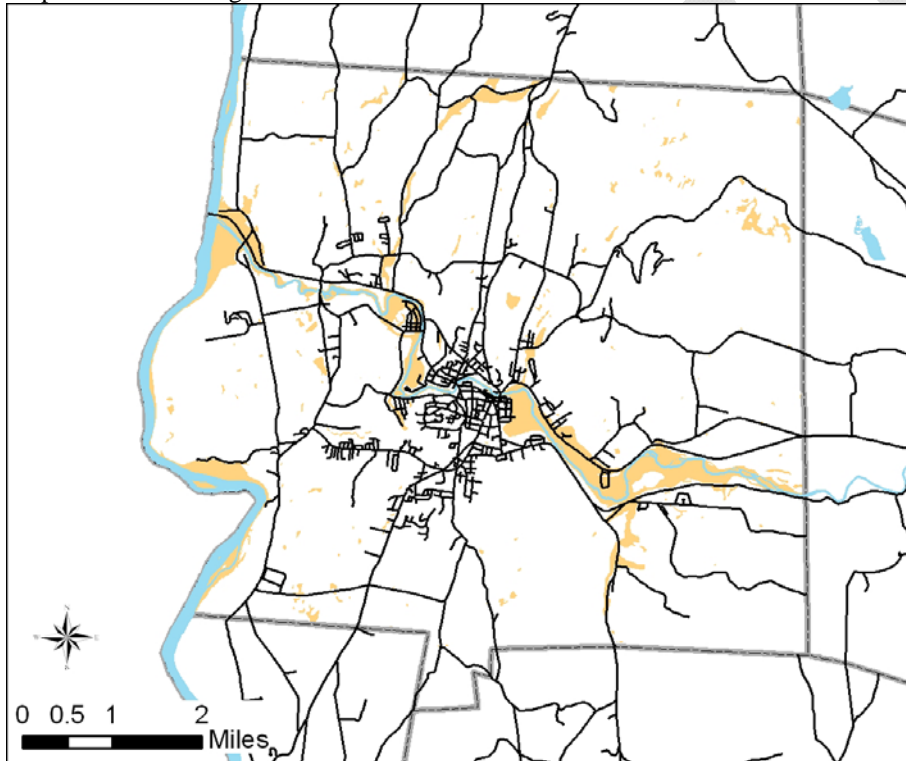
treatment and storage areas as well as part of the overall habitat for wildlife. Wetland areas in Claremont are generally well-distributed with concentrations along riverways and in small catchment areas.

- Wetlands are delicate ecosystems,
- susceptible to disruption by change
- possess the potential to absorb nutrients from sewage, wastewater effluent and runoff

1.3 Floodplains

Floodplains are the periodically inundated flat lands adjacent to rivers and streams. Floodplains serve as storage areas for water during times of flooding and provide travel corridors for wildlife. Due to their important ecological characteristics, development in floodplains presents some special problems, including: 1) A high probability of property damage during flooding; 2) The restriction of periodic water storage resulting in potentially greater flooding; and 3) The increased likelihood of erosion and sedimentation. The latter factor can cause increased turbidity of water in rivers and streams.

Map 7-2 Flood Storage in Claremont

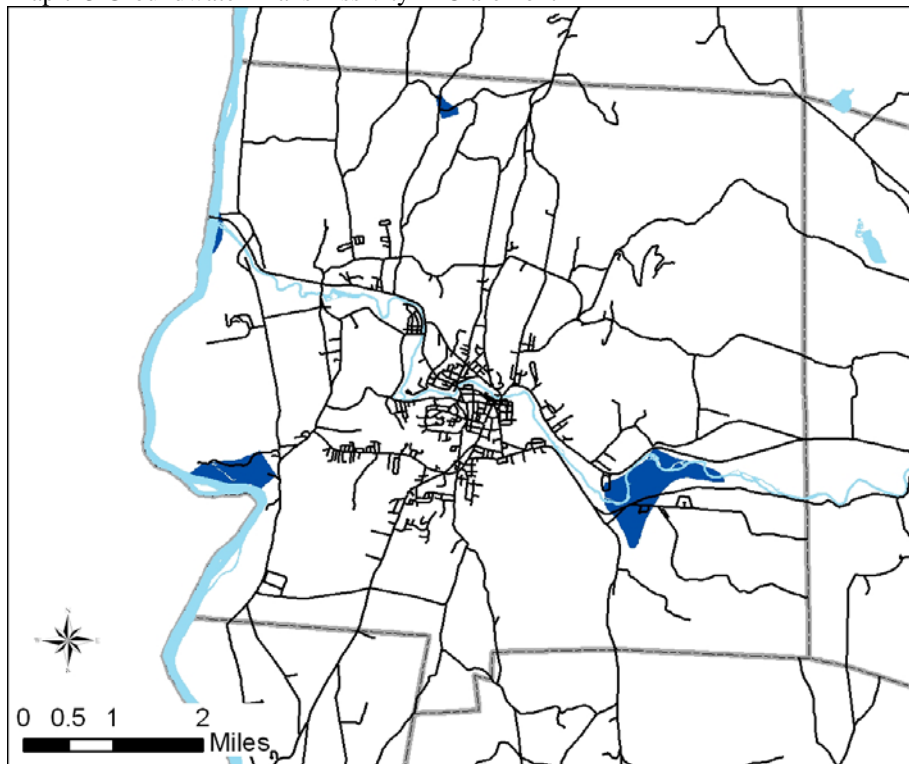


1.4 Groundwater Resources

Groundwater is water below the land surface. Groundwater is found in gravel pockets or in fissures in bedrock. The term “aquifer” describes water saturated earth materials from which a water supply can be obtained. There are three types of groundwater aquifers: stratified drift; till; and bedrock. The basic difference is that stratified drift and till aquifers are composed of unconsolidated glacial deposits (loose earth materials), while bedrock aquifers are solid rock. In stratified drift aquifers, the materials are sorted sand and gravel. In till aquifers, the materials are a gravel, sand, silt and clay mixture. In bedrock aquifers, the rock is fractured.

Groundwater is a vitally important resource, providing drinking water for more than half of the United States population and more than 95 percent of its rural population. Additionally, more than one-third of the water used in agriculture for irrigation and livestock watering nationwide is from groundwater resources. Many industrial processes depend on groundwater and it also serves to support sensitive ecosystems, such as wetlands and wildlife habitats.

Map 7-3 Groundwater Transmissivity in Claremont



1.5 Public Access to Surface Waters

Ashley's Ferry was established by Col. Joseph I. Hubbard, this was the Connecticut River ferry between Claremont and Weathersfield, Vermont was taken over by Oliver Ashley in 1784. This site is now known as Ashley's Ferry boat ramp.

1.6 Erosion Impacts on Surface Waters

Much can be done at the local level to prevent degradation of surface water quality. Shoreline protection, including preservation of vegetative buffer strips, and erosion and sedimentation control can both be used to reduce the amount of pollution entering surface waters. In developing a strategy for establishing protective buffers for surface waters and wetlands, the City should include protection and management techniques.

Land acquisition, from willing owners, is an important non-regulatory measure to protect water quality. The Conservation Commission is authorized by RSA 36-A: 4 to acquire the fee simple (full title) or a lesser interest in land for conservation purposes. Other water resource protection options to pursue are conservation easements, which place permanent restrictions on certain uses of the land, or landowner donations.

Erosion and sedimentation control and stormwater management are other tools that can be used to decrease surface water quality degradation associated with development and other activities.

Stormwater runoff from roads and other impermeable surfaces often enters surface waters directly or via drainage structures, and carries with it salt, sediment and other pollutants.

2 LANDSCAPE AND GEOGRAPHY

2.1 Topography

2.1.1 Steep Slopes

Areas of slopes over 15%, the point at which special precautions need to be taken, are abundant in Claremont. These areas are scattered throughout the northern and southeast sections of the city and are also found to the west of the downtown on Twistback Hill and on Barber Mountain along the Connecticut River. For the most part, these areas are zoned for low density development with one house per five acres. Development has tended to avoid these areas because of the extra costs and inconveniences involved with controlling erosion and installing a properly functioning septic system.

2.1.2 Scenic Areas: Highlands and Lowlands

Scenic features

- Hilltops and ridgelines
- Meadows and agricultural lands
- Water bodies
- Cultural and historic features
- “Working landscape” (farms, animals, crops)
- Natural features and open space
- Community gateways

2.2 Soils and Geology

2.2.1 Local Geology

The Soil Conservation Service has classified Claremont's soils into the following five groups:

Windsor-Unadilla Variant-Agawam: This group is found in the level areas along the Connecticut River and in the Downtown. The soils in this group were formed by glacial outwash deposits and tend to be deep, excessively drained and well drained sandy and loamy soils.

Bernardston-Cardigan-Kearsarge-Dutchess: Most of Claremont's soils are in this group. These are mainly loamy soils formed in glacial till and can be well drained or excessively drained.

Colton-Adams-Rumney: These soils are located along the Sugar River west of the Downtown. They are deep, loamy and sandy soils formed in glacial outwash deposits and alluvium.

Monadnock-Marlow-Lyman: This soil group is only found in the far southeast corner of Claremont. It consists of well drained and excessively drained loamy soils formed in glacial till.

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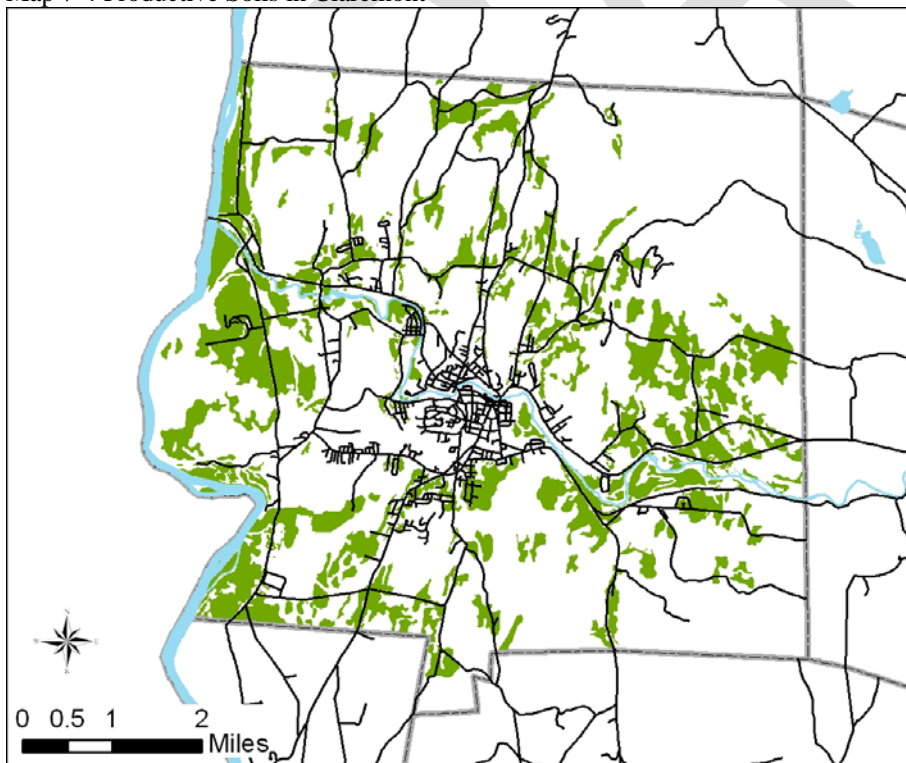
With the exception of a few small isolated patches, all of Claremont's soils are classified by the Soil Conservation service as having severe limitations for on-site septic disposal. This means that properties of the soil or site are so unfavorable that the need for special design results in significantly increased construction costs. In some areas, the limitation is caused by poor drainage, shallow depth to bedrock, or a high water table. In others, the problem is caused by layers of silt or clay. During the glacial period, the lower river valleys in Claremont were the bed of Lake Hitchcock. Soils in these areas contain layers of clay and silt that were deposited by this glacial lake. These deposits cause problems for on-site septic disposal because the effluent drains across these impermeable layers instead of down into the ground.

Most of the areas in Claremont with frequent reports of septic system problems are in the areas of glacial lake bed. These include the following:

- Chestnut Street Extension
- Lower portions of Green Mt. Road and Winter Street
- Hanover Street (ledge)
- Paddy Hollow
- Plains Road
- Beaugard Village
- Sullivan Flat
- Airport Hill
- Claremont Junction
- River Road-Grissom Lane area

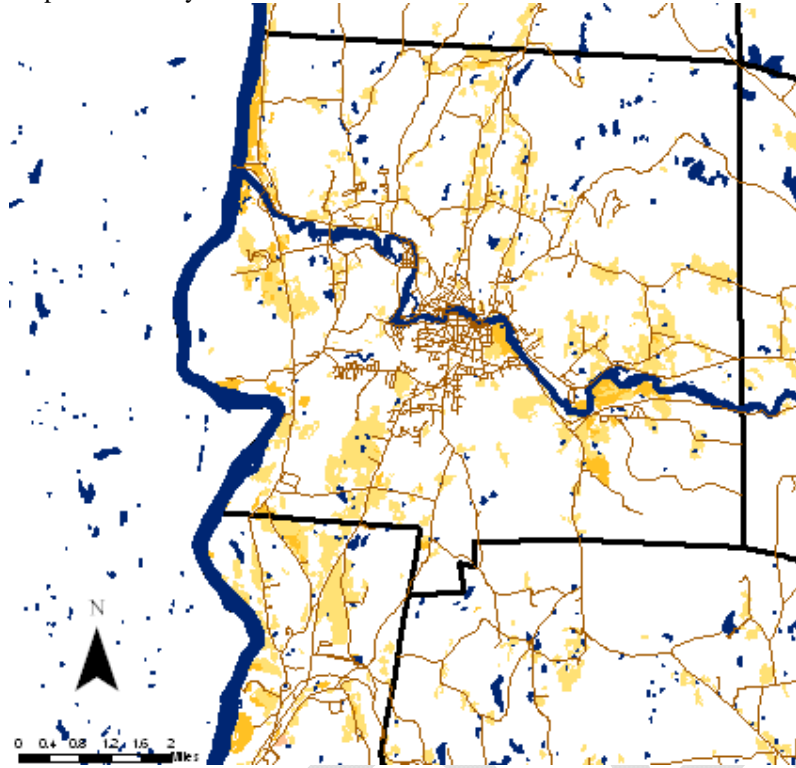
2.2.2 Agricultural Soils

Map 7-4 Productive Soils in Claremont



Agricultural lands usually impose the least constraints to development for residential, commercial, or industrial uses. This partly explains why the amount of farmland has decreased, and is the reason why the community needs to act soon if it wishes to conserve agricultural lands.

Map 7-5 Actively Farmed Land in Claremont



2.3 Community Use of Natural Resources

2.3.1 Open Space

The scenic landscape of a community helps define its natural, cultural and historical heritage and thus establishes its identity. A visually pleasing environment makes a significant contribution to a community's overall quality of life. The erosion of the visual character of a community can have not only psychological impacts, but also very real economic impacts through the loss of tourism, depreciated real estate, and an inability to market the community to prospective businesses and residents. As with other environmental impacts, visual degradation can happen incrementally to slowly change the character of a community. Open space land also provides wildlife habitat and corridors.

Much of the northern New England character is built upon the framework of the agricultural economy. These lands provide habitat and travel corridors for wildlife, educational opportunities and "breathing space" for residents and visitors, as well as a disappearing link with history. Local farms provide fresh, high-quality food directly to the community and the region, eliminating the need for energy- and cost-intensive shipment and travel. They contribute directly and also indirectly to the economy by providing the quality of life that attracts companies and their workforce as well as tourists.

The values or benefits of open space and agricultural lands include the following:

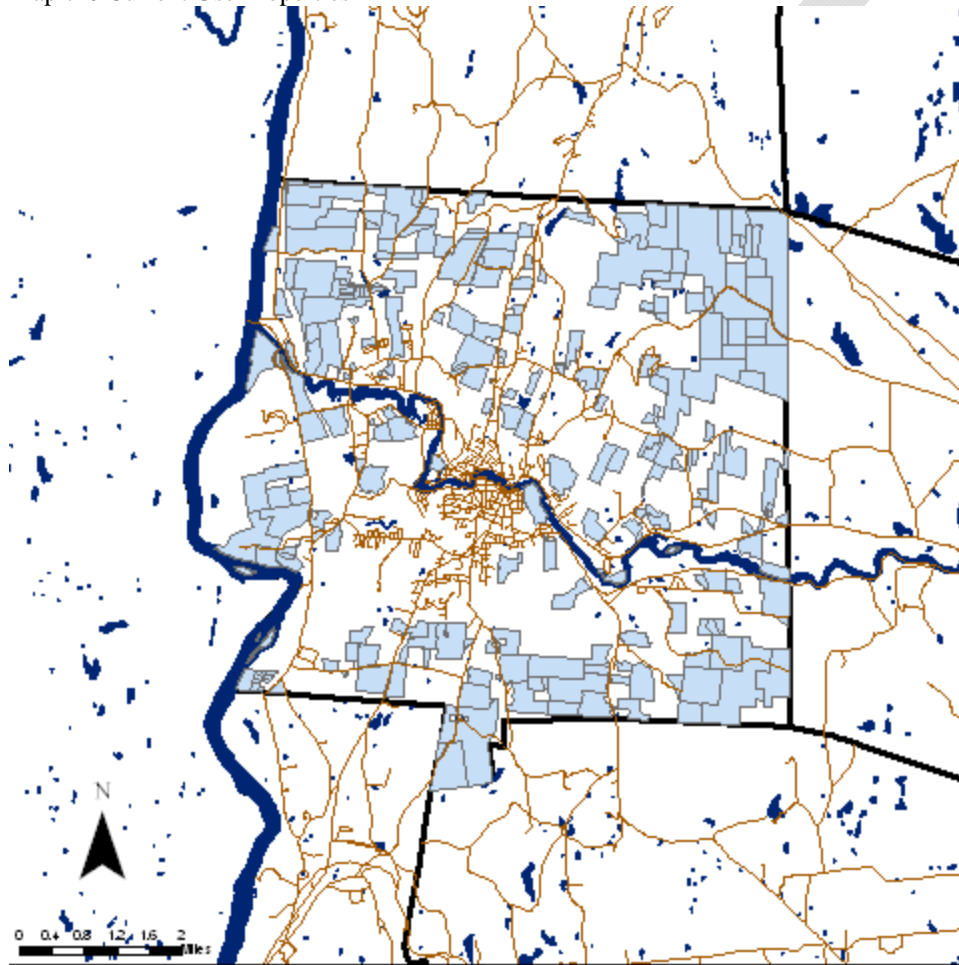
- Enhance the small-town character;
- Provide scenic views that contribute to the quality of life and to a visitor's aesthetic experience;
- Support tourism;

- Promote self-sufficiency and small-scale economy when continued for agricultural purposes;
- Enhance and protect wildlife habitat; and
- Ensure a positive fiscal impact on the city by enhancing property values and keeping property taxes down.

2.3.2 Land Development and Current Use

The current use program in New Hampshire provides property owners the benefit of reduced property taxes on open space lands, but does not ensure long-term protection. The purchases of conservation easements, development rights or fee simple acquisition of significant open space or agricultural lands do provide long-term protection.

Map 7-6 Current Use Properties



2.3.3 Recreation and Natural Resources

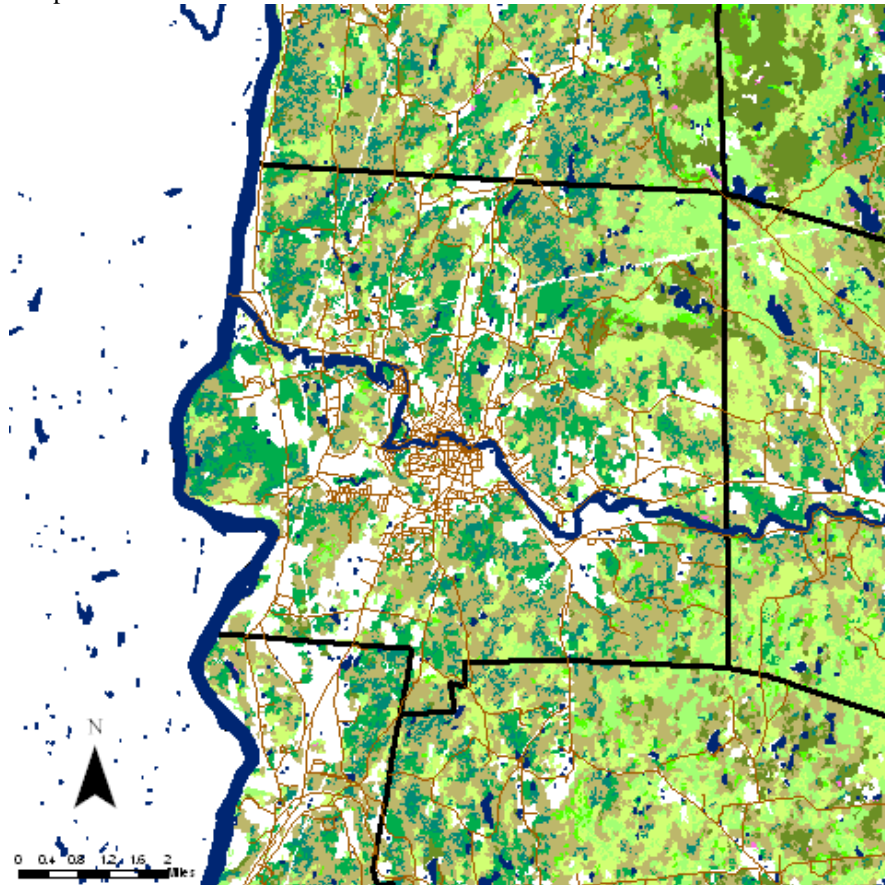
Trails, River Access, Parks and Open Space are integral parts of the community. It is often through recreation that the human environmental and natural environment amalgamates to create a whole community. More detail on the recreational opportunities in the City of Claremont’s urban and rural areas can be found in the Recreation Chapter of this Master Plan.

3 FOREST RESOURCES

3.1 Overview of City of Claremont Forest Management Plan

Forested areas provide the appealing backdrop for New England villages and serve as a commercial resource for local industries.

-Map 7 Forested Lands



Forested areas have many benefits, including:

- Providing important wildlife habitat;
- Providing jobs and raw materials for construction and wood products;
- Improving air quality;
- Contributing to the scenic landscape;
- Creating shade and acting as windscreens;
- Serving as a recreational resource; and
- Stabilizing land to minimize soil erosion and resulting sedimentation, which degrades water quality.

In 2008 forestry consultants, Ecosystem Management Co., Meadowsend Timberlands, LTD was hired by the City of Claremont and prepared a Forest Management Plan for the City of Claremont Forestlands. It included the following parcels: Arrowhead Forest, Cat Hole Road, Industrial Road Lots, Moody Park, Rice Reservoir, Veteran's Park, White Water Reservoir, and the Winter Street Lot. These lots contain approximately 1535 acres. The Natural Resource Chapter of the Master Plan adopts the Forest

Management Plan in its entirety. The major focus of the forestry plan is to identify trends and commonalities of all the identified city owned properties, and the management goals, objectives, and practices that will be generally applied. The forest conditions, specific management goals and objectives, timber volumes, soil types, access considerations, special wildlife habitat considerations, historical information and other specific details are addressed on a parcel by parcel basis.

The management plans for each individual parcel are designed for a 10-year period, however, they are meant to be flexible. As the science and knowledge base grows, as market conditions change, and as technology changes so must the management techniques. While the overall goals of management will remain consistent, the objectives and practices used to reach desired goals must be flexible.

3.2 Forest Management and Natural Resources

Management of the City of Claremont forestlands will be geared to meet multiple, often interrelated goals and objectives. Even though economically and sustainably growing and harvesting trees is notably a major focus of ownership, timber is only part of the resource evaluated in the planning process. Water resource protection, open land, wetland and riparian conditions, wildlife habitat, recreational opportunities, scenic value, as well as renewable natural resource products such as biomass and fuel wood are evaluated and included in management recommendations. Forest management on these lands will occur under the umbrella of land stewardship for the good of the forest and the people it serves.

Poorly managed forest harvesting operations, as well as development of large areas of forested land, can result in wildlife habitat degradation, soil erosion, and other negative environmental impacts.

- impacts of logging on surface waters
- forestry BMPs and protecting natural resources (secondary impacts)
- important to develop educational program regarding forestry for public and private lands (broad interest for city lands and private loggers possible)

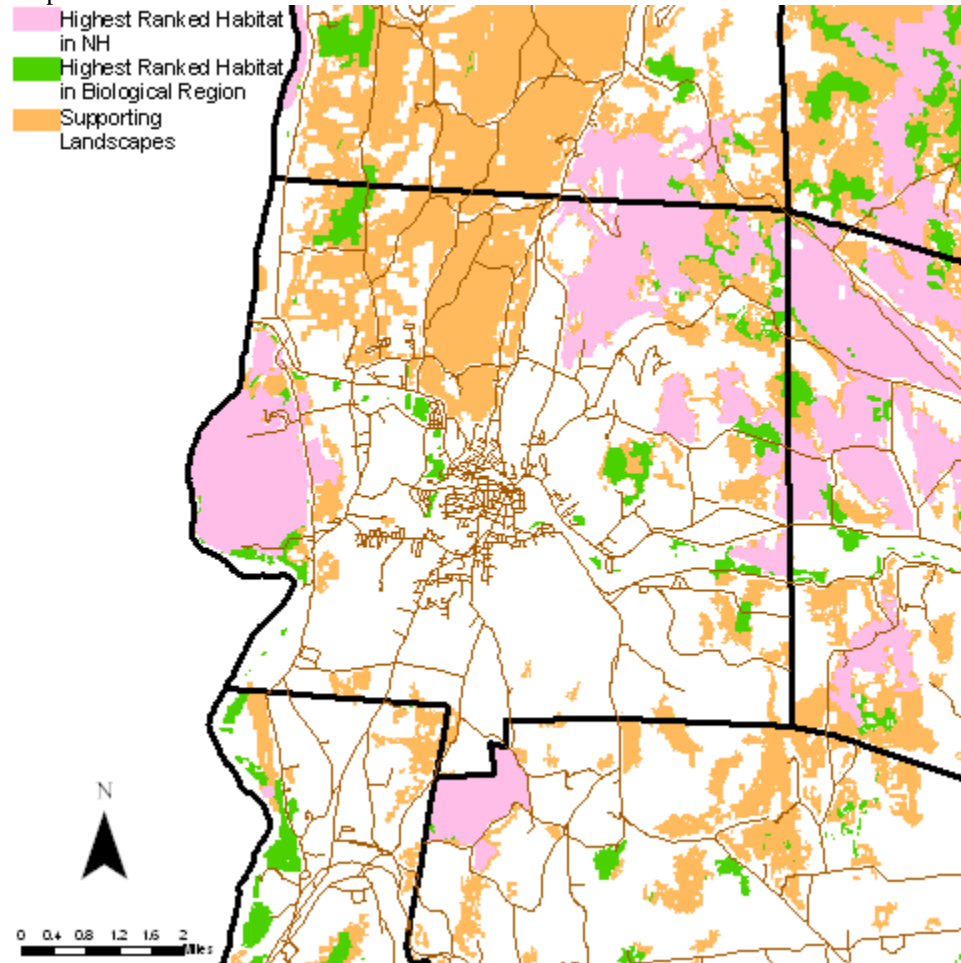
4 WILDLIFE RESOURCES

4.1 Wildlife Habitat

Important benefits of protecting wildlife habitat and maintaining biological diversity are:

- Wildlife and its habitat enhance our quality of life and enrich our community.
- Wildlife related activities, such as fishing, hunting and wildlife watching, generate significant economic activity.
- Wildlife and its habitats cannot be supported solely through public acquisition of lands for protection, so local communities and private landowners are critical partners in wildlife conservation.

Map 7-8 2010 State of NH Wildlife Action Plan



4.2 Wildlife and Human Development

There are four basic impacts on wildlife that result from development:

- Unique or significant habitats are not recognized as such and are subsequently developed;
- Too much of an area may be developed, leaving an inadequate representation of natural plant communities to support native wildlife;
- Some wildlife is more successful in association with human development at the expense of other species;
- Domestic pets, especially cats, prey on native wildlife.

The future well-being of wildlife depends upon large areas that are natural and undeveloped, as well as natural corridors along rivers, streams, and wetlands. A major challenge for biological diversity is sprawling development patterns that cover the rural landscape and that can cause habitat fragmentation. The fragmentation of wildlife habitat can result in parcels that are too small to support populations of some native species. Small parcels likely mean an increase in human disturbance, low productivity, decreased food availability, and increased predation by domestic animals. Wide-ranging species such as black bear will no longer be found in that habitat.

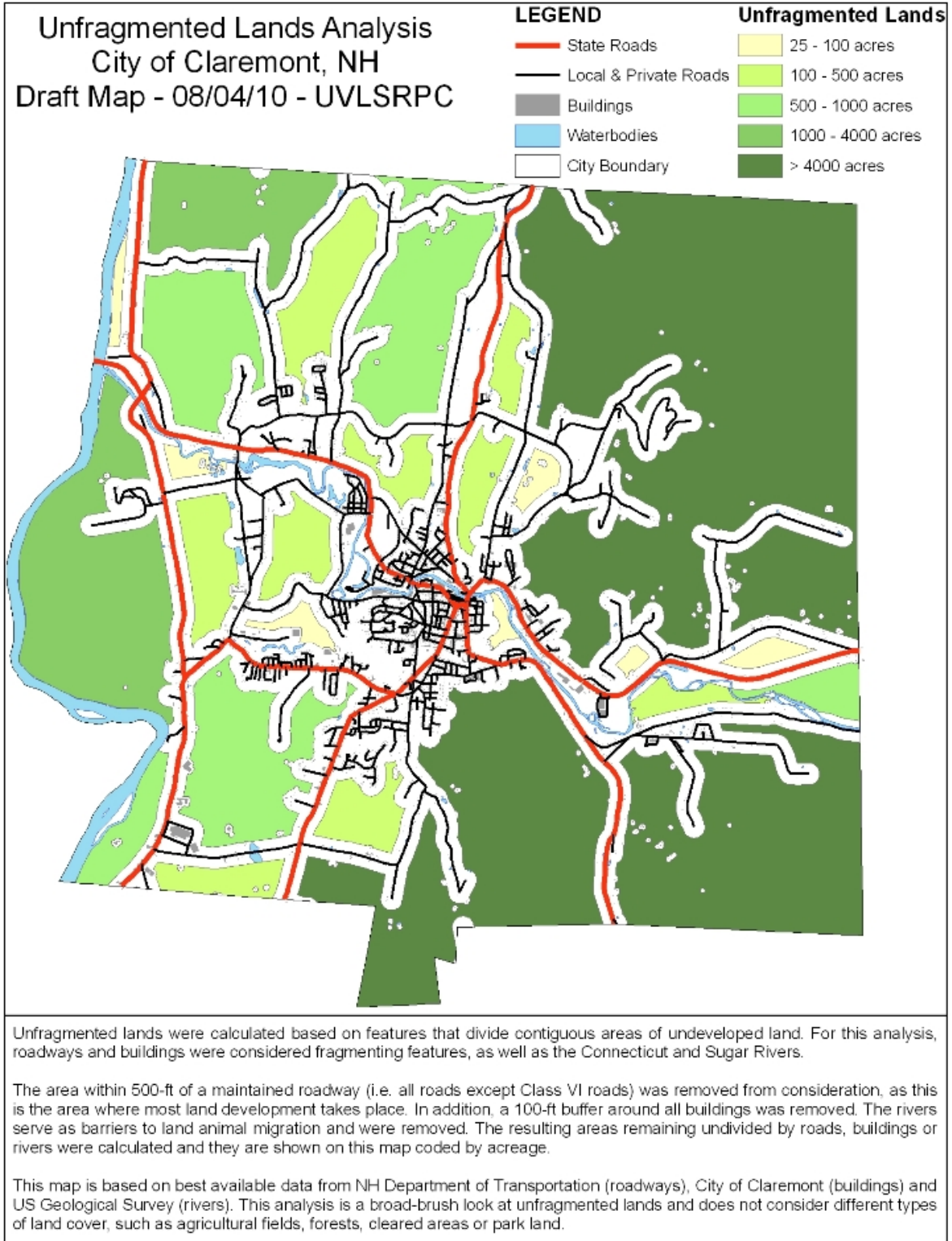
For optimum wildlife habitat, blocks of unfragmented land should be limited to human activity or development. Wildlife biologists consider 250 acres as a minimum for unfragmented habitat.

Importance of unfragmented lands:

- Wildlife habitat (broad roaming areas) – species' needs
- Acknowledge importance of open land (forested or clear) for habitat
- Interconnected areas improve diversity in gene pool

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Map 7-9 Unfragmented Land



5 GOALS, OBJECTIVES AND RECOMMENDATIONS

GOAL #1: NATURAL RESOURCE INVENTORY

RECOMMENDATIONS: Create an inventory to support the City of Claremont’s objectives for natural resources protection and provide a basis for informed land use planning

Objective 1: Provide a framework document that highlights the natural infrastructure to support numerous facets of municipal planning

Objective 2

Emphasize providing new natural resource information, as opposed to the dissemination of existing information

Objective 3

Provide a wetland component that will lend itself to support a multi tiered priority process

GOAL #2: IMPLEMENT FOREST MANAGEMENT PLAN

To actively manage Claremont’s natural areas with a strong land ethic in order to achieve responsible land stewardship. These stewardship activities will help to promote Claremont as a healthy community with a quality of life that values the environmental quality of forest ecosystems and the benefits of commercial and recreational land uses.

RECOMMENDATIONS: Adopt a holistic view of natural systems which places human activity within rather than apart from the natural environment.

Objective 1: Designate some “forever wild” areas to serve natural diversity and educational opportunities

Objective 2: Create educational infrastructure such as interpretive signs and kiosks and provide diverse opportunities for education

Objective 3: Identify and conserve important archaeological and cultural sites

RECOMMENDATIONS: Implement forest management that is ecologically, economically, and socially responsible.

Objective 1: Protect and improve the water quality of our water resources including streams and wetlands

Objective 2: Be responsible stewards of the land and its resources

Objective 3: Maintain the stability and integrity of the ecosystems within our control

Objective 4: Maintain a healthy, biodiverse, productive and aesthetically pleasing forest

Objective 5: Manage with respect to “Natural Community” type

RECOMMENDATIONS: Resource extraction should not exceed the regenerative capacity of the ecosystem or reduce natural productivity or diversity.

Objective 1: Enhance the quality and quantity of our timber resource

Objective 2: Manage for Sustainable harvest and growth

Objective 3: Provide periodic revenue through the sale of forest products

RECOMMENDATIONS: Adopt management practices that support indigenous habitats and prevent fragmentation so that wildlife can migrate for seasonal food and reproductive needs.

Objective 1: Provide and enhance the naturally diverse variety of wildlife habitat in forest, wetland, and open land settings

RECOMMENDATIONS: Manage for ecologically and socially sustainable recreational opportunities.

Objective 1: Continue to provide for both motorized and non-motorized sustainable recreation opportunities such as ATV and snowmobile trails, foot paths, and cross county skiing and snowshoe trails

Objective 2: Continue to provide recreational infrastructure such as picnic areas and shelters where appropriate

Objective 3: Create aesthetic vistas along recreational trails and wildlife viewing areas

Objective 4: Provide opportunity for hunting

GOAL #3: ENCOURAGE INDIVIDUAL LANDOWNERS TO BE GOOD STEWARDS OF THEIR OWN PROPERTIES

RECOMMENDATIONS: Promote public education on Best management Practices (BMPs).

Objective 1: Make available information on best management practices for agriculture, forestry, and other resource extraction activities.