

### III. NATURAL RESOURCES

The natural resources found in Grantham shape who we are as a community and play a major role in creating our sense of place. The natural resources around us—the geology, soils, ground and surface waters, forest communities, wildlife, clean air, and scenic resources—have a fundamental influence on our development as a town. These resources pose both constraints and opportunities for development, requiring both conservation and wise utilization, so that a balance is reached between continuing benefit and reasonable use.

A sound, thorough, and objective approach must be used in making decisions affecting our natural resources—an approach that understands the resources we have, and how we should manage and maintain them—while carrying out the the task of planning and guiding Grantham’s future growth and development. Recommendations in this chapter recognize the importance of the town's natural resource heritage, in the belief that they form the vital foundation providing Grantham’s quality of life. Thus, all growth and development of the town will be governed by the land's capability or limitations in supporting that development.

#### COMMUNITY VALUES

The Community Survey shows that residents of Grantham are highly supportive of maintaining and improving the protection of our natural resources. Highlights of this support are summarized below:

- The attributes most often chosen by residents indicate they value Grantham for its small, quiet, uncrowded atmosphere in an unpolluted natural environment.
- Residents want to see Grantham remain primarily a rural community in the years to come.
- The most important concepts in defining rural character are woods, wildlife, undeveloped spaces, and low traffic volumes.
- Aspects of open space that are important to preserve include open fields, surface waters, forests, and woodlands.
- Conserving natural resources in Grantham has strong support, and interest is expressed largely in scenic natural resources, natural areas, surface waters, and agricultural lands.
- Overwhelming support exists for continuing Grantham's efforts in acquiring lands considered significant to our rural character, including the use of tax dollars for purchasing land and/or easements.
- Nearly all respondents favor the Planning Board having the authority to require alternative layouts to development that would otherwise adversely impact significant natural resources.

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### EXISTING NATURAL RESOURCES

To aid in understanding the following discussion, it may be useful to consult the maps found in the Attachments to the Build-Out Analysis, Appendix B, and also US Geological Survey topographic maps (*Enfield Center* and *Sunapee* quadrangles, 1:25,000 scale).

#### Water Resources

Water resources are the naturally occurring components of the land that function to hold, store, move, and purify water. Examples are lakes, ponds, marshes, bogs, rivers, brooks, streams, flood plains, and aquifers. Collectively, these mutually vital hydrologic functions form a watershed.

Water resources are critical components of the functioning landscape of Grantham. They provide many benefits: flood storage capacity, wildlife habitat, scenic values, water supply for domestic and business uses, and recreational opportunities. They are completely vital for all life.

Prudent conservation of the town's water resources is accomplished by measures prohibiting impacts that damage the ability of these water resources to function as high quality components of the environment. Damaging impacts can result from a variety of human activities that take place within a watershed. Generally, the closer an activity is to the water resource, the greater its impact may be on the resource's ability to function. This is especially true for the placement of septic systems and activities that can lead to erosion and sedimentation, such as paved road runoff and removal of shoreline vegetation within and near riparian areas. The State of New Hampshire has issued a model Shoreland Protection Act which has been incorporated into Grantham's zoning ordinances. The Eastman Community Association's Environmental Control Committee's by-laws also provide protection for the shorelines in Eastman, primarily through the regulation of vegetation clearing, lawn care, and construction.

The water resources we see—the ponds, marshes, and brooks—are key elements of Grantham's scenic resources, in addition to the other significance they have. All water resources are limited and irreplaceable, and they should be protected. Human activities involving land development need to be carefully controlled where water quality and function are threatened or impaired.

#### *Lakes and Ponds*

Grantham has eight major lakes and ponds. From largest to smallest they are Eastman Lake, Stocker Pond, Butternut Pond, Miller Pond, Leavitt Pond, Chase Pond, Anderson Pond, Lily Pond and Grass Pond. (A small northern part of Eastman Lake lies in Enfield, and the western 2/3 of Chase Pond is in Plainfield.) Collectively these

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major open waters compose 527 acres (as measured from US Geological Survey topographic maps), approximately 3% of the total area of the town. All but Stocker Pond are found in North Grantham.

### *Wetlands*

Wetlands—marshes, bogs, forested wetlands, etc.—tend to be located where areas of poorly drained soils prevent rainfall from rapidly infiltrating the soil. In Grantham, much of the wetland communities are located along the brooks and rivers. The more extensive wetlands are shown on Attachment E of the Build-Out Analysis (Appendix B.) Six major wetlands are found throughout town. From largest to smallest they are the Bog Brook area in East Grantham, the Sugar River floodplains south of the village center, Sturgis Swamps west of Dunbar Hill Road, Stroing Marsh north of Eastman Lake, Miller Marsh in the vicinity of Miller Pond, Grass Marsh surrounding Grass Pond in North Grantham, and Colby's Meadows west of Miller Pond. Together these major wetlands make up 529 acres (per USGS maps), roughly the same amount of area as the lakes and ponds of the town.

Wetlands are both an important part of the hydrologic cycle and valuable wildlife habitat. Wetlands require diligent protection due to their value and fragility, since any nearby development activity could destroy a wetland as a functioning system through erosion, sedimentation, or other forms of pollution. Care must be taken to protect wetlands through a combination of state regulation and local protection, as well as buffer areas surrounding significant wetlands.

### *Rivers and Brooks*

Rivers and brooks, the corridors in which water flows by gravity from one source to another, may simply be called water drainages. Due to Grantham's varied terrain, many water drainages occur. In the east, Bog Brook along with Stocker Pond Brook form the beginning of the North Branch Sugar River. Stony Brook in the north (also known as Grass Pond Brook) and the North Branch Sugar River together appear to define the main north-south valley of the town, but the actual relationships of the water drainages are not quite that straightforward. Stony Brook does not actually flow into the North Branch Sugar River, but rather joins Butternut Brook from the north at a point west of Eastman Lake, just before Butternut Brook empties into Eastman Lake. South (downstream) of Eastman Lake there is Eastman Brook joining Bog Brook flowing from the northeast. The major brooks of Skinner (also named Rum in its downstream portions), Sawyer (or Shaw-Sawyer), and Shedd (or Littlefield) all drain into the North Branch Sugar River from the west. Ash Swamp Brook in the southwestern corner of town also drains into the North Branch Sugar River from the west, after it leaves Grantham and enters Croydon. All of these major drainages total over 25 miles in length, as measured from USGS maps.

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### *Floodplains*

Due to its topography, Grantham has a limited amount of floodplain area. Flood storage capacity is provided primarily by Grantham's ponds and the Bog Brook wetland area. The main flood hazard areas significant to Grantham's development are along the lower end of the Skinner/Rum/Sawyer Brook drainage north of the village center, and along the North Branch Sugar River south of the village.

Development in floodplains can lead to possible property damage and create a risk to health and safety. Development in a floodplain, such as an impermeable surface (e.g., a paved parking area), limits infiltration, accelerates runoff, and raises flood levels elsewhere. This process can extend the limits of the floodplain area. Grantham has already adopted regulations governing development activities in floodplains.

### *Aquifers and Groundwater*

Aquifers are generally underground layers of unconsolidated mineral material—silt, sand, and gravel—that collect and hold great quantities of groundwater. Aquifer maps were prepared in the early 1990s by the NH Department of Environmental Services, Water Resources Division, in cooperation with the USGS. Two very important groundwater aquifers are located in Grantham. One is in the area of Stocker Pond and the vicinity of Bog Brook. The other follows a portion of the North Branch Sugar River and NH Route 10. These groundwater reserves are likely sources for substantial fresh water supplies in the future. Grantham does not require a public water supply at present. But this groundwater resource is limited and irreplaceable, and thus should be protected for the future, in case Grantham ever finds it both necessary and economically feasible to develop a public water supply.

Elsewhere in Grantham, groundwater is found in highly variable quantities in the cracks, joints, and fissures that occur naturally in the underlying bedrock. This groundwater source serves the water supply needs of most individual residences and business buildings outside of Eastman, by means of private wells.

Careful control of human activities that could pose threats to the quality of any groundwater (i.e., activities in areas surrounding significant wetlands and near ponds, rivers, and brooks) is essential.

## Topographical Resources

### *Hills, Ridgelines, and Slopes*

Perhaps more than any other characteristic of the landscape, the hills, ridgelines, and slopes we see daily define for us the place we call Grantham. Croydon Mountain on the west is the dominant feature, seen from a great many locations in town. While Croydon Peak itself (2,766 feet) is in the Town of Croydon, the secondary high point of

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Croydon Mountain, known as Grantham Mountain, is just 100 feet lower and falls just within Grantham's boundaries.

In the north there are the numerous hills and ridges sloping upward to Snow Mountain in Plainfield and Prospect Hill in Enfield. South of these is the east-west ridgeline joining Sargent Hill with Croydon Mountain, plus Howe Hill and the varied terrain of Eastman. West of the village, Dunbar Hill is well known, and in the southeast is the large upland area whose higher points are Willow Peak (Sherman Hill) and Barton Hill/Lovers Leap Ledge. The views of these geographical features are among Grantham's most important scenic resources.

Significant areas of steep slopes are found in Grantham. The larger areas with 20% slopes or steeper are shown on Attachment E of the Build-Out Analysis (Appendix B). The largest area of steep slopes are found on Croydon Mountain in the Blue Mountain Forest Association's Corbin Park, and following the east-west ridgeline from Croydon Mountain to Sargent Hill. Other steep areas are found around Willow Peak (Sherman Hill) and Barton Hill/Lovers Leap Ledge in the southeast corner of town, along both sides of I-89 in the northern part of town, and throughout town along other ridgelines and hillsides. Currently, the zoning ordinance prevents construction on any part of a lot with slopes of 20% or more, and disallows such areas in meeting minimum lot size requirements.

### Soils, Forests, and Agricultural Resources

#### *Soils*

Soil resources are the collection of the top layer of earth that supports vegetation, generally a highly organic mixture of humus with sand, silt, or clay. These resources are finite in quantity and contribute vitally to water quality and land productivity. Soils are an important natural resource, since the soil properties of depth, permeability, wetness, slope, and susceptibility to erosion define the land's capability to support development, agriculture, and forestation. The uses of soil should be determined by their physical properties and their suitability to support proposed uses over their current use. For instance, prime agricultural soils, poorly drained soils, and erodible/steep slopes are good examples of soils that are not best suited for development.

The Soil Conservation Service has classified Grantham's soils into the following three groups:

- Colton-Adams-Rumney Found in the Bog Brook area in the eastern part of town, these soils can be excessively drained or poorly drained; they are loamy and sandy soils formed in glacial outwash deposits.

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- Monadnock-Lyman-Rock Outcrop Found along the western boundary of town and east along the hillsides to Sargent Hill, these are loamy soils formed in glacial till and can be well-drained or somewhat excessively drained.
- Monadnock-Marlow-Hermon The bulk of the town's soils fall into this category—loamy and sandy soils formed in glacial till that can be well-drained or excessively drained.

Many of the soils in these soil groups pose severe limitations for septic systems, either because of shallow depths to bedrock or because they are a poor filter for the effluent.

### *Forests*

Forests are not only important for forest products, clean air and water, outdoor recreation, and wildlife habitat—forests also contribute to scenic values and sense of place. Most forest communities in Grantham are found on poorly drained soils, or on steep slopes with shallow-to-bedrock soils, where there is a high potential for erosion.

Generally speaking, owners of the existing forest cover in Grantham should be encouraged to conduct active professional forest management and have their forest lands enrolled in the Current Use Tax Program. Both actions are fundamental to insure that forests are compatible with rural character and preserve values that benefit everyone. (It is appropriate to note here that open space usually produces a net revenue for the town versus development use, which usually results in net expense due to higher public service requirements.) Both private forestry and enrollment in Current Use can be accomplished through a combination of landowner education and local regulation.

Grantham is fortunate to have a large amount of town-owned open space forest land protected for the benefit of town residents. These properties total 546 acres and are composed of eight tracts. The largest of these town-owned properties is a 437 acre parcel, the "Town Forest," located at the end of the Class VI section of Miller Pond Road in North Grantham.

The Town Forest is managed by the Grantham Conservation Commission with the past guidance of professional forest management. The objectives of this ownership are:

- Maintain and improve the quality and productivity of the woodland for both wildlife and timber resources.
- Provide natural education and recreation opportunities for the people of Grantham.
- Identify and protect features of special value and interest.

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- Harvest forest products in a timely fashion, consistent with ownership objectives to provide income for the maintenance of the property and the benefit of the people of Grantham.

Being a rather large town-owned resource in a more remote area of town, and linking other conserved lands, the Conservation Commission should manage this property with exemplary forestry standards. This can also benefit residents by providing opportunities for forestry and conservation education.

### *Agricultural Land*

According to Soil Conservation Service data, Grantham has only 245 acres of prime agricultural soils and another 1,097 acres of good agricultural soils. Grantham's agricultural soils are located mainly in the area of the Eastman golf course, the Sugar River corridor, the Dunbar Hill area, and a portion of Howe Hill now part of Eastman. Careful thought needs to be given to the protection of agricultural soils and farmland (active or inactive) relative to the location of future residential development.

Grantham also has a few areas not devoted strictly to farmland. These include raising and keeping horses as well as active apple orchards. These particular areas should be given the same conservation consideration as would be given to farmland, principally to ensure that the remaining areas of agricultural soils are conserved.

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### *Deer Wintering Areas*

A map of deer wintering areas developed by the NH Fish and Game Department shows only two significant areas in Grantham. One is east of Eastman Lake in Eastman, and the other lies between Eastman Lake and Butternut Pond. Other areas in which deer activity is prevalent are the land west of Cote and Dunbar Hill Roads extending to the Corbin Park fence (including Sturgis Swamps), and the land north of Miller Pond Road to the Enfield and Plainfield borders.

### *Other Wildlife*

A rich variety of wildlife exists in Grantham, bringing both enjoyment and consternation, depending on whether the creatures are simply benignly being wild or are harming people, pets, or property. A complete listing would be too long for this document. However, two species deserve separate mention for their dramatic increases in recent decades.

First, moose have become quite common over the last 30 years. For at least the prior 30 years moose were extremely rare here. The permit hunting program for moose now usually produces successful hunters in Grantham each year. A major

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concern regarding moose is the hazard presented to drivers, especially on I-89 where vehicle speeds are high enough that collisions with the animals may cause significant injury or death to motorists.

Most everyone has enjoyed seeing wild turkeys in Grantham, and this species too has gone from nonexistent to abundant in less than 15 years, thanks to a reintroduction program. To date there have not been many problems resulting from the turkeys' presence. However, they may eventually present a hazard to motorists if their flocking habits and slow movements lead drivers to lose control while trying to avoid collisions.

It is the less common species that provide thrills for the wildlife observer. Coyote, bobcat, bear, wild boar, fox, weasel, fisher, heron, eagle, Canada goose—all these and many more are seen from time to time in town.

## GOALS

- Consider the natural resources of Grantham as irreplaceable assets, providing innumerable benefits (including the town's rural sense of place) and calling for responsible stewardship.
- Protect and conserve Grantham's natural and scenic resources, both privately and publicly owned, to uphold the health and function of these interconnected systems.
- Protect fragile environmental areas such as wetlands, aquifers, areas subject to flooding, and steep slopes.
- Prevent air and water pollution.

## RECOMMENDATIONS

- Support the Grantham Conservation Commission to a) acquire, conserve, protect, and manage important open space areas and natural resources, and b) work cooperatively with the Society for the Protection of New Hampshire Forests (SPNHF), the Ausbon Sargent Land Preservation Trust (ASLPT), and similar groups to conserve additional conservation and open space lands where appropriate.
- Sustain and increase the Grantham Conservation Fund or other dedicated capital reserve accounts for public acquisition of land, development rights, or easements to benefit conservation, wildlife habitat, agriculture, forestry, and recreation (e.g., by line item budgeting, bonding, 100% rather than 50% of the penalty proceeds from land withdrawal under the Current Use Tax Program, etc.).

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- Encourage the private use of deed restrictions and conservation easements as a method for protecting important open space areas and natural resources.
- Maintain intervening open spaces and green space links between the several current neighborhoods and built environments of town, with emphasis on maintaining and conserving large, interconnected, unfragmented areas.
- Strictly enforce a steep slopes and erosion/sedimentation control ordinance designed to prevent negative impacts from improper land use development and/or practices.
- Prepare a local wetlands inventory and evaluation, and consider designation of prime wetlands, using the wetlands map provided by the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) and/or by following the NH Wetlands Bureau Code of Administrative Rules, Chapter Wt 700.
- Protect Grantham's surface water by increasing the setbacks between surface water and both structures and septic systems, consistent with standards recommended by UVLSRPC and the NH Office of Energy and Planning (OEP), and adhering to the principles of the NH Shoreland Protection Act.
- Support limiting the horsepower of power boats and restricting jet skis on all Grantham's ponds, and encourage local property-owner participation in pond associations to assure continued water quality.
- Support activities to protect groundwater quality: a) underground oil and gasoline tank removal, b) groundwater quality monitoring at the discontinued town landfill site, c) road salt use reduction, and d) prohibiting activities creating greater quantities of hazardous waste than normally associated with residential activities.

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