CHAPTER 4: NATURAL RESOURCES

Squam River looking east from Memorial Park

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4.1 INTRODUCTION

The natural landscape of Ashland is comprised of forested lands, prominent hills and an abundance of water resources with the Squam and Pemigewasset Rivers and Little Squam Lake with its watershed streams. There are 1,270 acres of conservation land, 3,122.5 acres of land in current use, two active farms as well as several passive open fields located throughout town. Wildlife is abundant in Ashland, including bear, moose, deer and waterfowl on the rivers and lake.

Maintaining the essential rural character by protecting the natural resources of Ashland is a goal stated in the *Vision for Ashland*. Areas which would be appropriate to conserve from development should be identified and mapped on the Land Use Map (see Chapter 1). Agricultural and productive soils, flood storage areas, forest resources, and wildlife habitat would be included as areas of importance. A water resources management and protection plan also should be developed to address groundwater resources, shorelands, surface waters, wetlands and watersheds. There should be consideration of a goal for dark sky preservation as another resource not often recognized, but part of rural character.

4.2 INVENTORY OF NATURAL RESOURCES

4.2.1 Scenic Resources

Ashland has a wide variety of opportunities for the community to enjoy the natural resources in town. There are two scenic roads (a portion of Owl Brook Road and Sanborn Road), preserved lands with trails and viewscapes, the town beach and access to the lake. There are almost 1,270 acres of conserved land of which 850 are contiguous, making 15% of Ashland's total acreage open to a variety of public recreational opportunities.

4.2.2 Topography

The Town of Ashland land comprises 7533.8 acres with around 5,381 acres forested, 24 acres cleared, approximately 157.1 acres of agricultural land, and the balance developed. The water bodies and wetlands cover 409 acres total and include Little Squam Lake, with about 120 acres in Ashland; Squam River, approximately 1.8 miles in length with 30+/- acres of water and wetland (total wetlands in town approximately 87 acres); the Pemigewasset River on Ashland's northern boundary; Ames Brook, Owl Brook both of which feed into Squam River, Spring Brook, and Mill Pond.

Slopes

The slope of an area is measured by dividing the vertical height by the horizontal length or the rise over the run. For planning purposes, slope percentages are often used to determine where development should not occur due to the steepness of the building site. Slopes are usually considered not developable once they reach 25% or higher in gradient.[1] Ashland has slope requirements in the Zoning Ordinance with 25% as the maximum, and lesser gradients dependent upon the soil type. Slope percentages can also be applied when identifying areas of significant wildlife habitat.

Within Ashland, development is limited in some areas due to the steep topography, especially if town water and sewer is not available.

[1] New Hampshire Association of Conservation Commissions. *Handbook for New Hampshire's Municipal Conservation Commissions*. August 2004.

Ridgelines
As the boundaries between watersheds, land use in these ridgeline areas can have a negative impact for great distances downstream. Development on ridges is also highly visible, affecting viewsheds. The soils on many ridgelines are shallow, but support mast-bearing trees such as oaks and beech, an important food source for wildlife. These trees also minimize erosion and degradation of wetlands and waters below.

4.2.3 Soils

Soil types can help communities determine land uses, identify where to focus conservation efforts, and locate wildlife habitat. When mapping, poorly drained soils can be potential wetland areas, and well-drained soils are associated with agricultural use, also making it favorable to development, both highlighting where local preservation efforts and development may compete. Rockier soils are generally found on steeper slopes, a result of glacial or glaciofluval activities prevalent in the New Hampshire landscape. According to USDA Natural Resources Conservation Service's web soil survey tool, over 33% of the Town of Ashland is Tunbridge-Lyman-Rock outcrop complex. The Town of Ashland's soil types and mapping is readily available on the internet at websoilsurvey.nrcs.usda.gov. A copy of the current soil data/map is attached as Appendix A. Additional soils information can be found on the conservation commission's page of the Town's website.

Excavations
Chapter 155-E of the New Hampshire Revised Statues requires that, with several exceptions, all mining and excavation operations in the State obtain prior approval and permit from the local municipality in which the operation is to occur. The purpose of the Statutes is to minimize safety hazards created by open excavations; to safeguard the public health and welfare; to preserve our natural assets of soil, water, forests and wildlife; to maintain aesthetic features of our environment; to prevent land and water pollution; and to promote soil stabilization.

Terrain Alteration
Earth-moving operations, such as cut and fill, reshape the topography of the land. Such activities can result in soil erosion and increased water runoff, leading to water pollution and damage to public and private lands. There is also direct or indirect loss of wildlife habitat. Activities that disturb more than 100,000 square feet of terrain (50,000 square feet within protected shorelands) require a permit from the NH Department of Environmental Services (NH DES). A town can adopt more stringent regulations if deemed appropriate for the topography within its boundaries.

Farmland Soils
In an effort to preserve rich soils from development, soils are classified relative to their use as farmland. Ashland has approximately 157.1 acres of productive soils actively in pasture and farmland and are located primarily in the Rural Residential Zone.

Soils which are considered to be of local importance within Grafton County must meet the following qualifications:

- Soils that are poorly drained, have artificial drainage established, and are being farmed

- Specific soil map units identified from the Natural Resources Conservation Service (NRCS) county soil survey legend, as determined by the Conservation District Board
- All land that is in active farm use[2]

Although not abundant in Ashland, prime farmland soils exist which are described nationally as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are available for these uses". Specifically, prime farmland soils are:

- Soils that have an aquic or udic moisture regime and sufficient available water capacity within a depth of 40 inches to produce commonly grown cultivated crops adapted to New Hampshire in seven or more years out of ten.
- Soils that are in the frigid or mesic temperature regime.
- Soils that have a pH between 4.5 and 8.4 in all horizons within a depth of 40 inches.
- Soils that have either no water table or have a water table that is maintained at a sufficient depth during the cropping season to allow cultivated crops common to New Hampshire to be grown.
- Soils that have a saturation extract less than 4mmhoc/cm and the exchangeable sodium percentage is less than 15 in all horizons within a depth of 40 inches.
- Soils that are not frequently flooded during the growing season (less than 50% chance in any year or the soil floods less than 50 years out of 100).
- The product of erodibility factor times the percent slope is less than 2.0 and the product of soil erodibility and the climate factor does not exceed 60.
- Soils that have a permeability rate of at least 0.06 inches per hour in the upper 20 inches; and
- Soils that have less than ten percent of the upper six inches consisting of rock fragments larger than three inches in diameter.[3]

Approximately 4% of this acreage is currently protected by conservation ownership or easement. Strategies to consider for safeguarding the future of this important resource are the creation of a Right-to-Farm Ordinance, an agricultural overlay district and/or through the acquisition of agricultural easements.

Hydric soils

Hydric soils are one of three indicators of a wetland (the other two being vegetation and hydrology). Wetlands provide important habitat for many species and are some of the most diverse ecosystems that exist. Overall, Ashland has 65.2 acres of wetlands that include along the Squam River and Little Squam Lake.

Very Poorly Drained Soils (Hydric A): Water is removed so slowly that the water table remains at or on the ground surface for the greater part of the surface for the greater part of the time (9-10 months of the year). Very poorly drained soils occupy level or depressed sites, are frequently ponded, commonly have a thick, dark-colored surface layer, and have gray subsoil. Hydric A soils in the Town of Ashland are shown on the map in Appendix A.

[2]Natural Resources Conservation Service. Soil Data Map: New Hampshire, Grafton County. http://soildatamart.nrcs.usda.gov/Report.aspx?Survey=NH009&UseState=NH
[3]Natural Resources Conservation Service. *New Hampshire Soil Attribute Data Dictionary*

Poorly Drained Soils (Hydric B): Water moves so slowly that the water table remains or on the ground surface for a large part of the time (6-9 months of the year). These soils occupy nearly level sloping sites, are ponded for short periods in some places, have a dark-colored surface layer, and have grayish subsoil which is mottled in most places. Hydric B soils in the Town of Ashland are shown on the map in Appendix A.

Currently, Ashland does not have any wetlands designated as prime wetlands. RSA 482-A:15 sets out the requirements for a municipality to designate a wetland as a prime wetland. Once the wetlands are designated by the municipality, DES reviews the submission and, upon approval, will consider any future projects that are in or adjacent to prime wetlands as major projects which require a field inspection and a public hearing.[4]

Vernal Pools

Vernal pools are a type of wetland, holding water during the spring, and are dry in summer. They do not support fish populations, but are critical breeding habitat for amphibian species. They are small, generally less than .01 acres and do not break the forest canopy. An important aspect in the complexity of an ecosystem, they are often mistaken for insignificant puddles and therefore easily destroyed.[5]

A survey should be taken to locate essential vernal pools in Ashland to map for future reference.

4.2.4 Water Resources

Surface Water

Surface water, about 344 acres of it in Ashland, is an important feature for the recreational and scenic opportunities, with Little Squam Lake and the Town beach, along with the Squam River that runs through the Town. The Squam River, with its 112 foot drop in elevation in its three-mile course through town, provided a natural location for hydro power in the past for mills and currently there is still one active hydro power station. The twelve miles of streams include Owl Brook and Ames Brook which feed into the Squam River. A 4.8-mile stretch of the Pemigewasset River, including two old oxbows, borders Ashland. The health and well-being of the Squam Lakes and associated waterways is directly related to the economic well being and quality of life in the Town. There are several local organizations working to resolve issues that threaten the lakes and preserve the natural habitat of the area.

Watersheds

A watershed is the area of land that drains into a particular water body. Ashland is in the lower portions of the Squam River and Pemigewasset River watersheds and the headwaters of the Lake Winnipesaukee Drainage (approximately 53%, 38%, and 9% of the Town, respectively). Types of land uses within a watershed can impact water quality and flooding in a negative way for humans and wildlife. A percentage of over 10% impervious surface coverage leads to declining health of streams. The cumulative effects of runoff should be considered in land use policies of the Town, and working with other neighboring towns in the watershed for regional protection is recommended.

[4]NH Department of Environmental Services Wetlands Bureau. *Guidebook for Wetlands Permits*. http://www.des.state.nh.us/wetlands/guidebook/primewet.htm

[5]Sperduto, Daniel D. and William F. Nichols. *Natural Communities of New Hampshire.* http://www.nhdfl.org/formgt/nhiweb/Documents/NaturalCommunitiesWeb.pdf

When considering land use activities along the shorelands, the Town's regulatory body needs to consider that the Shoreland Water Quality Protection Act establishes minimum standards for the subdivision, use and development of shorelands adjacent to the state's public water bodies.

Flood Storage Areas

Floodplains are included in the NH Natural Service Network as Flood Storage Areas; 864 acres are identified in Ashland. Floodplains are the low-lying lands where water spreads out when snowmelt or heavy precipitation causes overflowing of the banks of streams and rivers. They also provide the surface on which a river meanders over time. They provide important habitat for wildlife –mammals, amphibians, several species of turtle, and many breeding and migrating birds.

Groundwater

Groundwater includes water stored in stratified drift (sand and gravel) aquifers and in bedrock aquifers, and is the most common source of drinking water in New Hampshire. Groundwater is also important to wildlife as the source of springs and seeps which provide water in upland areas and feed surface waters. The NH Natural Services Network identifies approximately 245 acres of water supply lands in Ashland, which is part of the second largest aquifer in the state and is the Town's municipal water supply. The well is located off Route 3, just west of I-93. Additional aquifers exist in Town.

4.2.5 Significant Habitat & Wildlife

An essential resource for all native species is habitat that provides food, water, shelter, breeding areas and safe travel routes. This valuable habitat also contributes to human existence by providing clean water, clean air, recreational opportunities, aesthetic values and rural character. Refer to NH Fish and Game's *The New Hampshire Wildlife Action Plan* and NH Wildlife Connectivity Model www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/using_maps.htm

Potential Threats

Exotic weed Species: There are exotic plant species in Ashland including, but not limited to, black swallow-wort, fragmities, purple loosestrife, invasive honeysuckle, oriental bittersweet, European barberry, burning bush, autumn olive and Japanese knotweed. Of special concern to the residents of Ashland is the presence and preponderance of Variable-Leafed Milfoil in Little Squam Lake and the Squam River. A survey of invasive species within the Town should be conducted, and rules and regulations regarding the transport, disposal, planting, etc. of these species should be enforced to prevent their spreading further through the Town.

Water Pollution: All the waterways in New Hampshire suffer from mercury contamination due to air pollution entering the waterways by affixing to rain. Thus, all waterways in New Hampshire are classified as "Impaired" by NH DES. There is also the potential for *Escherichia coli* contamination in Little Squam Lake. Other impairments as identified by NH DES include pH, non-native aquatic plants, habitat impairments, reduced aquatic life for unknown reasons. These issues are part of a regional problem, and the effects on local waterways are being monitored by local organizations.

Light pollution: One factor in the environment that is usually overlooked is the adverse effects of artificial lighting: sky glow, glare, decreased night visibility, energy waste and negative impacts to wildlife, particularly migrating birds. Controlling this type of pollution should be included as part of development considerations.

4.2.6 Conservation and Public Lands

Conservation lands in rural areas can help preserve wildlife habitat, protect drinking water and contribute in maintaining the character of the community. Other land, such as agricultural, public, and large unfragmented tracks also are important to animal and human communities and have the potential to be developed if not protected.

While conservation land does not provide tax revenues comparable to developed land, studies show conservation lands demand far less municipal services, they often have an appreciative affect on other land and property values, they support industries such as tourism, and as mentioned here, provide an important contribution to the recreational opportunities in Ashland. The Trust for Public land (TPL) provides a new service called "Conservation Economics" that assists communities in determining the economic impact of investments in parks and open space. TPL studies have shown that conservation returns from four to ten dollars for every dollar invested.[6]

Conservation Lands

Within the town there are areas of protected forested lands that allow some public access:
The Homestead Forest, owned by the Lakes Region Conservation Trust, is a 604-acre conservation area located on Lambert Road (off Winona Road in New Hampton). There is an established trail system with a map offering hiking and nature watching opportunities to the public. The Scribner-Fellows State Forest is a 140-acre area managed by NH Department of Recreation and Economic Development (DRED) located on Route 132. Open to the public, hunting is permitted and snowmobile trails run through this area. No trail system has yet been developed. The Stevens Memorial Forest and the Newsom Memorial Forest, are both owned by the New England Forestry Foundation (NEFF). They are contiguous and accessible from Leavitt Hill Road. Managed by a local volunteer Forest Steward, there are trails open to respectful use by the public for hiking, biking, cross-country skiing, and other non-motorized recreation. NEFF promotes community "working forests" which includes scheduled logging activity to provide a mix of habitats. Glidden Forest, located on Highland Street, is a 108-acre property under a conservation easement held by the Squam Lakes Conservation Society. While there are no formal trails or a map, traditional hunting trails exist and it is advisable to check in with the landowner for access permission. Church Hill WMA is owned and managed by NH Fish and Game Department and is located off North Ashland Road. The terrain is steep with only old logging roads for access. Hunting is allowed, but it currently affords little else for recreational pursuits. The School Forest is a 15-acre tract owned by the School District located between Highland and School Streets adjacent to Ober Elementary playground. There is a developed fitness trail also used for nature study during the school year, as well as for public hiking and cross-country skiing seasonally. Adequate parking is available at the school for general public use. The 5.8 acre Owl Brook Conservation area, where the brook flows into Little Squam Lake, is protected by a conservation easement held the Squam Lakes Conservation Society and is not open to public use.

[6]http://www/tpl.org/what-we-do/services

Current Use Lands

Presently, there are 3,122.5 acres of land under current use. Property owners can file for reduced property taxes through the Current Use Taxation program. The current use value is the assessed valuation per acre of open space land based upon the income-producing capability of the land in its current use, not its real estate market value. This valuation shall be determined by the Town's assessor in accordance with the range of current use values established by the Current Use Board (CUB) and in accordance with the class, type, grade, and location of the land. Owners of parcels of land which are not anticipated to be used for a different type of use in the future can apply at the Town Office for the following categories:

- "Farm land" means any cleared land devoted to or capable of agricultural or horticultural use as determined and classified by criteria developed by the Commissioner of Agriculture, Markets and Food and adopted by the CUB.
- "Forest land" means any land growing trees as determined and classified by criteria developed by the state Forester and adopted by CUB. For the purposes of this paragraph, the CUB shall recognize the cost of responsible land stewardship in the determination of assessment ranges.
- "Unproductive land" means land, including wetlands, which by its nature is incapable of producing agricultural or forestry products due to poor soil or site characteristics, or the location of which renders it inaccessible or impractical to harvest agricultural or forest products, as determined and classified by criteria developed by CUB. The CUB shall develop only one category for all unproductive land, setting its current use value equal to that of the lowest current use value established by the CUB for any other category.
- "Open space land" means any or all farm land, forest land or unproductive land as defined by this section. However, "open space land" shall not include any property held by a city, town or district in another city or town for the purpose of a water supply or flood control, for which payment in place of taxes is made in accordance with RSA 72:11.
- "Wetlands" means those areas of farm, forest and unproductive land that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

A land use change tax equal to 10% of the market value at the time a property no longer qualifies for current use shall be levied when the land use changes from the open space use to a non-qualifying use. The Conservation Commission receives ten percent up to $5000 of this land use change tax for its Conservation Fund.

Forest Resources

Approximately 75% of land in Ashland is forested. Forests provide the natural vegetation for most of New Hampshire's landscape that contributes to clean air and water, protection of watersheds, as well as providing both recreational and economic opportunities. Forests are essential habitat for most of New Hampshire's wildlife. Forestry can provide income for some people in Ashland, and the timber tax it generates would provide funds to the town. Forests are a renewable resource and a source of income, and future sustainable forestry activities should be encouraged. As sited above, two of the conservation parcels in Ashland are owned by the New England Forestry Foundation which promotes healthy forest management. Much of Ashland's forested lands are privately owned and not protected.

Agricultural Resources

The Town of Ashland currently has no designated agricultural districts. There are two active farms in Ashland, Owens Farm on Route 175 and the Obers' Farm on Owl Brook Road. There is open inactive pastureland on Highland Street, some of which is under a conservation easement, and some in current use. Also worth mentioning is the backyard family farm which is growing in popularity in the Town, and may include keeping livestock on a small scale as well as growing fruits and vegetables.

Unfragmented Land

Parcels over 100 acres provide habitat for a wide variety of species and allows for feeding, breeding, and nesting to occur in areas removed from development. This land classification includes agricultural lands, woodlands, wetlands, water bodies, and rivers and streams less than ¼ mile wide. Land within 300 feet of a roadway, rivers greater than ¼ mile wide, and developed shorelines are not considered unfragmented. The combined acreage of three of the conservation properties in Ashland creates 805 of contiguous land and currently, abutting unprotected properties are undeveloped.

4.3 PRESERVATION MEASURES

There are many techniques available to assist with conserving natural resources. Basic data being documented and surveying residents to set goals for future land use patterns is an ongoing process. The Community Vision states that town policies and ordinances must protect our natural resources, community values, and preserve the essential rural character of the town. Regulatory protection measures are an important part of a town's preservation toolkit. They include modifications to the Zoning ordinance, Subdivision regulations, and Site Plan Regulations.

4.4 LOCAL AND STATEWIDE RESOURCES

The State of New Hampshire and the Lakes Region have many organizations which are involved in the natural resources issues. These groups conduct research, facilitate recreational opportunities, educate the public, work on land preservation, and monitor resources.

Grafton County Conservation District, Orford, NH
Lakes Region Conservation Trust, Center Harbor, NH
Lakes Region Planning Commission, Meredith, NH
Loon Preservation Committee, Moultonborough, NH
New England Forestry Foundation, Littleton, MA
NH Association of Conservation Commissions, Concord, NH
NH Department of Environmental Services, Concord, NH
NH Fish and Game Department, Concord, NH
New Hampshire Audubon, Concord, NH
New Hampshire Natural Heritage Bureau, DRED, Division of Forests & Lands, Concord, NH
NH Office of Energy and Planning, Concord, NH
Plymouth State University Center for the Environment, Plymouth, NH
Society for the Protection of NH Forests, Concord, NH
Squam Lakes Association, Holderness, NH
Squam Lakes Conservation Society, Holderness, NH
Squam Lakes Natural Science Center, Holderness, NH
UNH Cooperative Extension, North Haverhill, NH

NH F&G Wildlife Action Plan Maps done in 2010:
http://maps.wildlife.stat.nh.us/website/maps/WAPmaps/Ashland/ashland

The Coordinated Review of Land Use Planning Documents with respect to Wildlife Habitat, Natural Resources, and Smart Growth Principles: Ashland, NH is a great resource available on the Town website.

4.5 RECOMMENDATIONS

- Encourage conservation ownership or easements on environmentally sensitive or important lands
- Work on strategies to maintain wildlife connectivity zones within the town
- Identify local priorities for open space protection
- Consider adopting regulations to minimize destruction of native vegetation during construction, encourage the use of native species in landscaping, and encourage plantings that are drought-tolerant and require little supplemental nutrients
- Consider adopting a goal pertaining to dark sky preservation
- Encourage natural resource protection strategies, including sediment and erosion control, watershed management, and wetland protection as mitigation strategies for flooding
- Work in collaboration in regional efforts to protect the Pemigewasset and Squam watersheds [Adopt The *Pemigewasset River Corridor Management Plan*]
- Work with adjacent towns to protect shared aquifers
- Consider protection for wetlands and headwater streams to maintain downstream water quality
- Consider adoption of Excavation regulations
- Work with the Planning Board to delineate and create an overlay district to protect the Town's productive and agricultural soils and/or Right-To-Farm Ordinance
- Work with the Planning Board to identify potential environmental impacts to Town from large wind energy systems

Appendix A maps are also posted on the Conservation Commission's webpage.