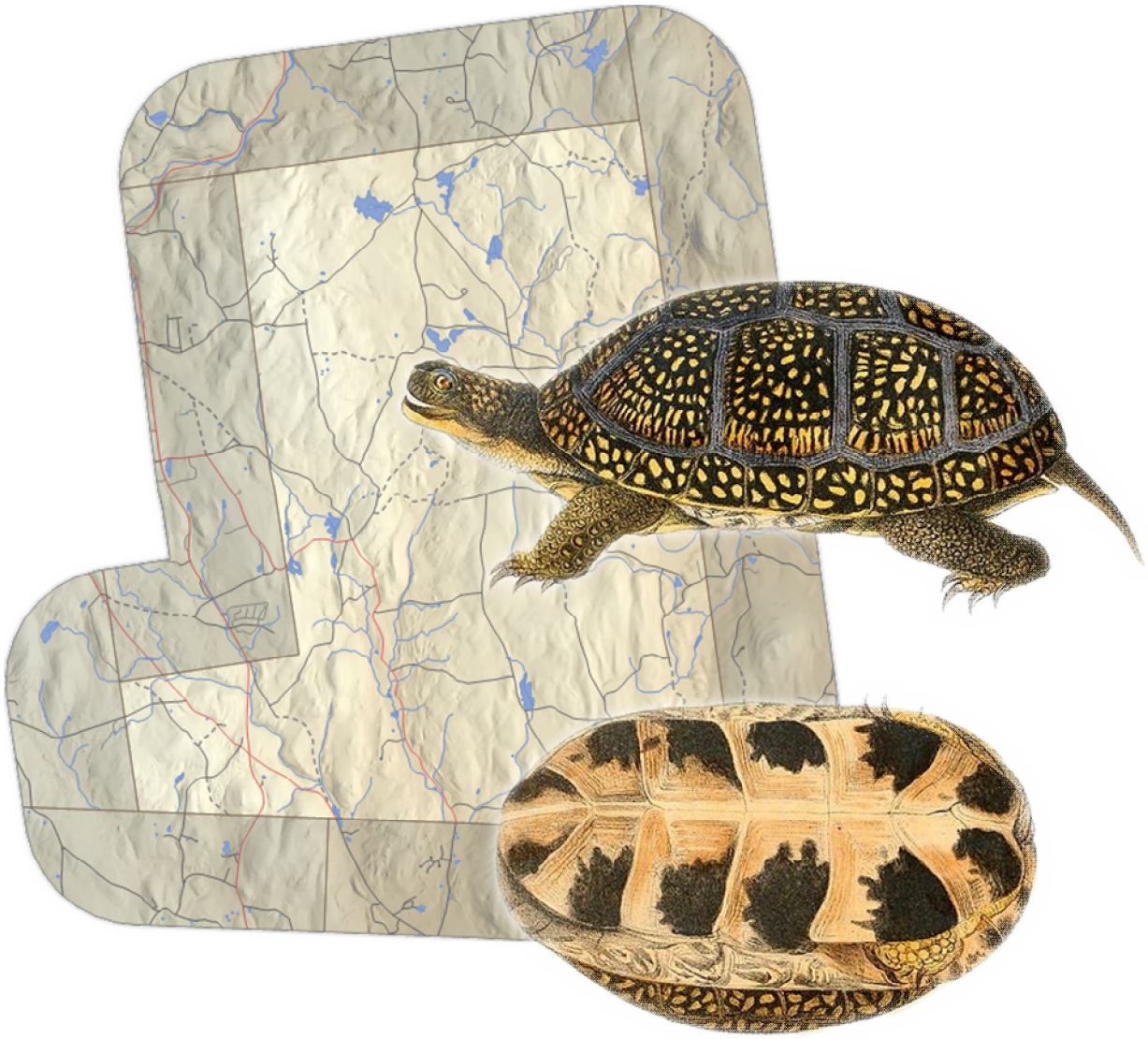
The Natural Resources of Mason, N.H.

A Natural Resources Inventory

Mason Conservation Commission

Rev. 1.0, 2012



This Natural Resources Inventory is dedicated to the memory of Stuart "Stu" Sherman, a steadfast and enthusiastic member of the Mason Conservation Commission from 2000 until his death in 2009. Stu loved Mason's wild landscapes and rural character. He served the community as a member of the Mason Volunteer Fire Department and was a First Responder. And most importantly, Stu was the first to recognize the importance of making a natural resources inventory for Mason. This effort carries on his legacy.

The Mason Conservation Commission:

Bob Larochelle, Chair
Barbara Devore
Bob Dillberger
Rob Doyle
Anna Faiello
Liz Fletcher
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On the cover

Blanding's Turtle, *Emydoidea blandingii*. From a hand-colored lithograph originally published in North American herpetology; or, A description of the reptiles inhabiting the United States by John Edwards Holbrook, 1842. This work is in the public domain.

In the background: a relief map of Mason with one-mile buffer, the area covered by this report and accompanying maps.

Stu Sherman photographed an endangered Blanding's Turtle in Mason, which provided the inspiration for the cover design.

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1. Background

A natural resources inventory (NRI) is an accounting of natural resources within some geographic area. This circular definition doesn't say much, and subsequent sections explain more fully. But in general, this report is a catalogue of natural resources within the Town of Mason. It captures in words and maps a snapshot of key elements of Mason's natural environment.

1.1. Why Prepare an NRI?

In general, the Mason Conservation Commission (MCC) undertook this project for two reasons:

An NRI is a statutory requirement.

In fact, other than holding meetings, preparing an NRI is the only activity conservation commissions are required by law to undertake. RSA 36-A:2 requires that conservation commissions "conduct researches into…local land and water areas [and]…keep an index[1] of open space and all natural, aesthetic, or ecological areas" within the boundaries of the relevant town.

An NRI is a precursor to protecting and managing natural resources.

The state legislature didn't include the NRI requirement just to gather an accounting of resources in New Hampshire. Rather, the accounting is a prerequisite to developing realistic plans for protecting and managing those resources.

The second point has wide-ranging implications for residents and town agencies. For example, this NRI can be used to:

- Help citizens understand the reasons for town-directed conservation activities.
- Support the town master plan and guide its implementation.
- Show the value of protective buffers along streams and ponds.
- Help the town set priorities for easements and land acquisitions.
- Show areas of town-owned land that are and are not suitable for income-producing forestry and agriculture.
- Help guide the Planning Board and Zoning Board of Adjustment in evaluating site and subdivision plans, particularly with regard to open space requirements.
- Show areas suitable for recreational activities such as hiking, horseback riding, and mountain biking.
- Identify sensitive areas such as steep or south-facing slopes, and rare or endangered wildlife habitats that warrant special protection and preservation.

In short, anything the town does outdoors can be done better with a good understanding of the natural resources potentially affected.

1.2. What's In This NRI?

As noted in the previous section, the authorizing RSA refers to the NRI as an index of natural resources. But it's much more than a simple list.

First, each town has some leeway in defining what it considers to be a natural resource. Water, forests, wetlands, and wildlife clearly fall within the definition. But the definition also can include open space, views, outdoor recreational opportunities and similar intangibles that add immeasurably to our quality of life and the

[1] The word "index" here is used in the sense of a list describing the items of a collection and where they may be found. [SWO04]

town's rural character. This report covers those naturally occurring elements that are important to the Town of Mason, whether tangible or not.

Second, the word "index" doesn't restrict the report to a mere listing of resources. This report includes both a written document and a set of maps. The two compliment each other. The maps show spatial relationships between related natural resources, and between natural resources and human artifacts such as roads and political boundaries. The written report includes relevant natural history, explains why certain resources are important, and points out nonobvious or particularly important facts about the resources or the relationships between them.

2. Our Approach for This Project

Every town approaches the task of developing an NRI differently, as priorities, financial resources, and staff resources vary from town to town. This section briefly describes the approach used by the MCC to develop this NRI for Mason.

2.1. Specific Goals for This Project

As an earlier section notes, an NRI is a means to an end. It's also open-ended and potentially very broad in scope. To focus our efforts and help us get started, we looked ahead to a time when the NRI would be complete, and thought about the next steps we might take once it was done. To do that, we brainstormed ways to complete this sentence:

When the NRI is done, we can…

The following list enumerates our answers, more or less in priority order:

1. Write a Conservation Plan for the entire town.
2. Write management plans for town land holdings.
3. Raise public awareness of conservation.
4. Make objective decisions about land use.
5. Evaluate and set priorities for potential land purchases.
6. Identify the best open space for protection within the town.
7. Identify the best open space for protection within new subdivisions.
8. Build a town-wide trail system.
9. Identify, monitor, and mitigate invasive plant infestations.
10. Write a town Wildlife Action Plan.

Some of these goals overlap. And several items from this list (most notably those describing plans to be written) represent projects in their own right. We anticipate that the latter will be subjects of future reports.

Other items on the list represent ways in which the information in this report can be used to manage town resources on an ongoing basis, both by the MCC and by other town bodies. Together with the *Mason Master Plan* [MAS07], this information will we hope prove invaluable to the Select Board, Planning Board, and Zoning Board of Adjustment when making decisions about land use within Mason.

2.2. Project Conditions

Preparing an NRI is a labor-intensive task and can be quite expensive if relegated to a contractor. However, Mason is fortunate in having a conservation commission comprised of talented people with relevant skills. To save money and take advantage of this talent pool, we chose to develop Mason's NRI ourselves.

Specifically, this report was prepared under the following conditions:

- The research, map production, and report were all done using volunteer labor, the bulk of it (almost 1,000 hours) by MCC members. No paid contractors were involved, although we did on occasion take advantage of free services and data provided by the Nashua Regional Planning Commission (NRPC) of which Mason is a member. The only capital outlay for the project is the cost of printing a few copies of the NRI for key town agencies.
- The NRI is focused on maps and less so on text. While this written report is an important component of our NRI, readers are encouraged to spend more time studying the maps than reading this text. In particular, over time, things will change as the town changes. Our intent is to focus on keeping the maps up-to-date. The text, in contrast, is likely to lag behind.
- Most of the data on which the maps and report are based is freely and publically available. Most map data comes from GRANIT at UNH. Some comes from MassGIS.[2] Still more is supplied by the federal government. See Appendix II for a complete listing of data sources.

  Relevant reports and analyses can be found with an Internet search, or accessed directly on N.H. and U.S. government Web sites. For those without Internet access, a letter to the relevant state or federal agency, or a trip to your local library will yield similar results. Certain corrections and extensions to map data have been made reflecting available local knowledge, but we've made no attempt to verify the map data overall for the simple reason that doing so is beyond the abilities of a small volunteer group.
- To save money, the NRI is being delivered to the town primarily in electronic form and to a limited extent in printed form. Printed maps and copy of the report will be delivered to the Select Board, Planning Board, and Zoning Board of Adjustment. An additional copy of the maps and report will be delivered to the library for reference by town residents. Additionally, the maps and report will be available on the Internet so residents can read them on-line, or download and print personal copies.

3. The Maps

This report accompanies a set of five maps and one overlay. This section briefly describes what you see in each map. Subsequent sections will help you interpret what you see.

Forest and Farmland Soils

This map shows Mason's soils ranked by potential for forestry and agriculture. Colored areas represent forest soil classifications. Generally speaking, brighter colored areas are more suitable for forestry than other areas. For details about forest soil types, see Sec. 5.1 Forest Soil Groups.

Crosshatching identifies soils well suited to agriculture[3]. For more information about agricultural soils, see Sec. 5.2 Agricultural Soil Types.

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[2] Some data of interest to Mason is not available for Massachusetts, and some is available but organized differently than the New Hampshire data. We hope to adapt and incorporate more Massachusetts data in a future project.

[3] "Agriculture" as defined by the USDA Natural Resources Conservation Service (NRCS)

Hydrologic Resources

This map shows water-related town resources. Water is obviously important for both humans and wildlife, so this map shows resources relevant to each. For details about the various resources shown on this map, see Sec. 5.5 Wetland Types and Sec. 5.7 Soil Drainage Class.

Unfragmented Habitat Blocks

Many wildlife species (especially larger species) require uninterrupted land areas for hunting and breeding. These areas (known as "unfragmented habitat blocks" or just "unfragmented blocks") are ranked according to their size and shape. This map shows unfragmented blocks in Mason. See Sec. 5.4 Unfragmented Habitat Blocks for information about how unfragmented blocks are measured and classified.

Wildlife Habitat Ranking

Conditions that favor wildlife don't occur in isolation but rather overlap. Areas with larger numbers of overlapping conditions are considered more important than areas with fewer overlaps. This map shows the relative importance of overlapping wildlife habitat conditions in Mason and rates those areas on a numeric scale (the larger the number the better for wildlife). For details about the rating system, see Sec. 5.3 Habitat Co-Occurrence Scores.

Wildlife Habitat Types

This map shows the location and extent of various officially recognized wildlife habitat types. Habitat types are defined by the New Hampshire Fish and Game Department, and documented in the *New Hampshire Wildlife Action Plan* (NHWAP) [WAP05]. For more information, see Sec. 5.6 WAP Habitat Types.

Parcel Overlay

A transparent overlay showing property boundaries.[4] For use with the other maps.

Also, at the right side of each map are miniature versions of the other maps. You can use these smaller maps to help keep your place when moving from one map to another or as a quick reference to related points of interest on other maps.

4. Mason's Natural Resources

This section gives an accounting of important natural resources within town boundaries. Because natural resources are generally unaffected by political boundaries, also included here when relevant is additional information about resources in abutting New Hampshire towns and in Massachusetts.

Natural resources are in general identified, categorized, and described by a wide variety of scientifically based analyses and classification techniques. Describing these techniques is beyond the scope of this report, but for reference Appendix I includes some of these details. Readers unfamiliar with the technical terms used can look there for introductions to the relevant topics.

[4] Because the parcel outlines were generated from different data than was used for the other maps, property bounds do not align perfectly with other map features. Readers should not rely on this map to determine property boundaries.

4.1. Wildlife and Wildlife Habitat

Wildlife habitat can be organized and analyzed in many different ways. Here, we chose three common methods:

Habitat Type Organizes habitats into broad categories based on characteristics of the land and vegetation. In this report, we use the classification scheme devised by the N.H. Fish and Game Dept. as described in NHWAP.

Unfragmented Blocks Organizes habitats into categories based on a relative measure of disturbance by humans and suitability for large animal species.

Habitat Ranking Organizes habitats into categories using a combination of other organizational schemes to yield a combined rating of a habitat's suitability for wildlife.

Each of these analyses is represented by its own map within the accompanying map set. The following sections describe each analysis in turn.

4.1.1. Wildlife Habitat Types

Habitat types are defined in NHWAP. For a summary of this information (as well as references for more detail), see Sec. 5.6 WAP Habitat Types. The map **Wildlife Habitat Types** shows how this classification scheme applies to Mason.

Although seven recognized habitat types occur in Mason, five types cover most of the town's area as shown in the following table:

Table 1. Mason's Primary Habitat Types

Habitat Type	*Acres*	*Percent of Mason*	*Percent Across N.H.*	*Importance*
Hemlock-Hardwood-Pine Forest	8,385	55.0	45	Supports 140 vertebrate species (15 amphibian, 13 reptile, 73 bird, 39 mammal). Supports 5 species of concern: osprey, Cooper's hawk, timber rattlesnake, eastern hognose snake.
Appalachian Oak-Pine Forest	5,644	37.0	7	Supports 140 vertebrate species (8 amphibian, 12 reptile, 67 bird, 17 mammal species). Supports 5 species of concern: osprey, Cooper's hawk, timber rattlesnake, eastern hognose snake.
Marsh and Shrub Wetlands	336	2.2	2.4	Supports numerous vertebrate and invertebrate species. Supports 18 species of concern: American black duck, American and least bitterns, woodcock, common moorhen, northern harrier, osprey, pie-billed grebe, rusty blackbird, sedge wren, Blandings and spotted turtles, eastern red and silver haired bats, New England cottontail, and ringed boghaunter.
Grasslands	257	2.0		Supports (at least) 10 species of concern: northern harrier, upland sandpiper, grasshopper sparrow, eastern meadowlark and horned lark, vesper sparrow, black racer, smooth green snake, northern leopard frog, wood turtle.
Peatlands	55	0.5		Provides an important carbon buffer.

As the map and this table show, more than 90% of Mason's acreage is forested. The predominant forest type is hemlock-hardwood-pine. The south-central portion of Mason is almost entirely hemlock-hardwood-pine, which is also the state's predominant forest type.

Mason's other predominant forest type, the second most common habitat type in town, is Appalachian oak-pine forest found throughout town in patches of varying size. This forest type is far less common statewide; Mason has an unusually large share because the town is located in the transitional zone between northern and southern forest types.

Other habitat types that occur in Mason are relatively small in area. Grasslands are found only in the western and southwestern parts of Mason. The only other upland habitat type mapped for Mason is talus slope or rocky ridge, shown in two isolated areas: one near Lost Valley on the Brookline line, the other in southwest Mason south of Old Ashby Road, near the area of Rattlesnake Hill (note that talus slope is a preferred habitat of timber rattlesnakes).

The following sections take a closer look at each habitat type.

4.1.1.1. Hemlock-Hardwood-Pine Forest

Hemlock and beech are the primary late-successional (climax) trees in this habitat, and can attain maximum ages of 500 and 300 years respectively. The mix of tree species in this forest type varies according to the soils and terrain. Hemlocks often occur in ravines or rocky sites, beeches on till soils, red oak and pine on drier sandy or rocky soils.

4.1.1.2. Appalachian Oak-Pine Forest

Appalachian oak-pine forest is associated with drier sandy or rocky soils, and tends to have a history of fire disturbance. The transition between Appalachian oak-pine and hemlock-hardwood-pine can be difficult to delineate due to considerable overlap in soils that support both forest types. To delineate these habitat types, NHWAP used soil series most strongly correlated with Appalachian oak-pine that did not overlap with hemlock-hardwood-pine.

4.1.1.3. Marsh and Shrub Wetlands

The marsh-shrub system is grouped into three broad categories: wet meadows, emergent marshes, and scrub-shrub wetlands. Wet meadows are dominated by herbaceous vegetation less than three feet high, such as sedges. These areas are saturated for long periods during the growing season but seldom flooded. Marshes are dominated by taller herbaceous vegetation such as cat-tails. In marshes, the water table is at or above the surface throughout the year, but fluctuates seasonally. Scrub-shrub swamps are dominated by woody vegetation such as highbush blueberry, winterberry, alder, dogwood, and buttonbush. These regions frequently flood in spring or contain pockets of standing water.

All these types of wetlands, including forested wetlands, can be flooded by beavers. Beaver flowages are considered to be very important habitats for all sorts of wildlife.

Most species associated with wetlands use surrounding uplands for foraging, dispersing, reproduction, cover, and over-wintering. Maintaining undisturbed buffers around wetlands is critical for wildlife population viability. In areas protected for nesting waterfowl, N.H. Fish and Game requires at least 300 feet of undeveloped upland buffer around wetlands. Many reptiles and amphibians require larger buffers to prevent population decline. For example, Blanding's turtles may travel a mile or more from wetlands where they normally live. Because wildlife uses a mosaic of wetland and upland landscapes, NHWAP notes that a landscape-level planning effort will be required to maintain New Hampshire's biodiversity ([WAP05], Appendix B, page 129).

Finally, a glance at the **Hydrologic Resources** map reveals numerous smaller (possibly unclassified) wetlands peppering the town. Most of these smaller wetlands are forested. Some may be isolated but many are connected by intermittent streams.

4.1.1.4. Peatlands

Peatlands are wetlands defined by limited inputs of groundwater and surface runoff that result in low nutrient content and acidic water. These conditions cause organic materials to decompose slowly and thus cause peat to accumulate. Kettlehole bogs are a type of peatland. Some plants are specifically adapted to peatlands, including rare species such as pitcher plants and sundews. Timber harvesting in peatlands can alter the nutrient balance and runoff input, and result in soil compaction which damages peatlands.

Mason's peatlands are scattered in small areas throughout the town. The largest peatlands are found off Townsend Road south of Briggs Road. Others lie near Captain Clark Highway at the Wilton line, west of Greenville Road, Hurricane Hill Road at the Townsend line, on town land on Starch Mill Road, and two patches off Walker Brook Road. But regardless of location, this habitat type is important, uncommon in Mason, and unlikely to return once gone, making it worthy of special protection.

4.1.1.5. Grasslands

Grasslands are found chiefly in the western and southwestern parts of Mason. These habitats are mainly hayfields, with some being pasture, cropland or orchard. Mason's most extensive grasslands are the hayfields along Greenville Road, most of which belong to the town thanks to Bronson Potter's bequest. Mason's other outstanding grassland-type areas are the farmlands in the vicinity of Fitchburg and Turnpike Roads.

The majority of grassland habitats in New Hampshire are related to agricultural activity. Prior to European settlement, the creation and maintenance of grasslands are ascribed to beavers and the Native American use of fire to manage the landscape. Beaver meadows, heathlands, hayfields, pasture, cropland, airports, landfills, and military installations are all included under grasslands in NHWAP. New Hampshire's airports provide some of the most extensive high-quality grassland habitat. The most challenging issues facing grasslands and the species that use this habitat for breeding are development and agricultural practices such as mowing during breeding seasons.

4.1.2. Unfragmented Habitat Blocks

Large land areas unfragmented by paved roads are essential for the long-term viability of numerous wildlife species. Roads not only cause road-kill but also tend to be corridors of development which displaces wildlife habitat and is associated with other disturbances, such as outdoor lighting, loud noise, and wandering pets that threaten wildlife.

The map **Unfragmented Habitat Blocks** shows where Mason's most viable habitat areas are likely to occur. Table 2 gives an overview of the ten largest blocks in town.

As the map and Table 2 show, Mason's northeastern corner is the town's largest unfragmented area. This area is part of a very large unfragmented block that includes lands in Milford and Wilton as well. Within this block are several conserved areas:

- In Mason:
    - The 508-acre Fifield Tree Farm Conservation Easement.
    - The 285-acre Mitchell Brook Conservation Land.
    - The 163-acre Spaulding Brook Conservation Land.
    - The 100-acre Mitchell Hill Conservation Land.
- In Wilton: the 200+ acre Stephens Forest.
- In Milford: the 400+acre Mile Slip Wilderness.

However, the majority of land within this block remains unprotected.

This block is part of a larger region highlighted as the Badger Hill/Spaulding Brook focus area (12,200 acres) in *Focus Areas for Wildlife Habitat Protection in the Nashua River Watershed,* a 2000 study by the Massachusetts Audubon Society [COL00]. To quote this study from page 24:

> *This area in Mason, Brookline, Wilton, and Milford, New Hampshire features diverse topography with Spaulding Brook, Mitchell Brook and smaller streams cutting through a series of steep-sided valleys between Boynton, Burns, Badger, Hutchington, and Pale Hills…. The uplands adjacent to the brooks are crucial to the maintenance of these feeders to the Nissitissit as clean, cold-running habitat for aquatic invertebrates and native fish populations…. Badger Hill/Spaulding Brook serves as a habitat core, and together with the Townsend State Forest focus area (8,698 acres), offers a wide corridor for wildlife.*

This study indicates that Mason is part of a wildlife corridor lying between Townsend State Forest to the south, and Badger Hill in Wilton to the north. The **Unfragmented Habitat Blocks** map bears out the potential of this corridor. Along the eastern side of town, three large unfragmented blocks connect the Spaulding Brook block to Townsend State Forest. However, other than the 2.5-acre Esau Stanley, Jr. Wildlife Refuge, there are presently no other conservation lands in Mason within these three blocks.

Table 2. Mason's Ten Largest Unfragmented Habitat Blocks

Block Location	*Total Size (ac.)*	*Conserved in Mason (ac.)*	*Block Score*[5]	*Outstanding Features*
Northeast Mason, southwest Milford, and southeast Wilton	7,160	1,068	11	Spaulding Brook and Mitchell Brook valleys, Spaulding Brook Pond, Badger Hill (Wilton).
Southeast Mason, Brookline, and Townsend, Mass.	3,085	2.5	9	Stanley Wildlife Refuge, Gould Mill Brook and wetlands, Lost Valley, Townsend State Forest (Mass.).
East Mason north of Brookline Rd., and Brookline	2,605	0	9	Babb Meadow, Lancy Brook.
Northwest Mason, northeast Greenville, south Wilton	1,893	434	8	Pratt Pond, Russell-Abbott State Forest, Mason RR Trail, Souhegan River (Wilton).
Central Mason from Depot Rd. north to Sandpit Rd.	1,356	180	9	Rocky Brook valley, old Mason Quarry, Wolf Rock, Pole Hill, Mason RR Trail.
Southwesterly Mason Brook (between Rts.123 & 31) and Townsend, Mass.	1,174	7.5	7	Scott Hastings Memorial Land, Mason Brook valley, Walker Gorge.
East Mason south of Brookline Rd.	1,087	0	8	Gould Mill Brook, Hurricane Hill.
Southwest Mason, southeast New Ipswich, and Ashby, Mass.	972	0	6	Locke Brook (New Ipswich and Ashby).
West Mason west of Greenville Rd., and Greenville	859	345	7	Bronson Potter Homestead, d'Arbeloff conservation easements.
West Mason east of Greenville Rd.	665	224	7	Bronson Potter View Fields.

While the northeast corner of town is clearly important, it's worth noting that absent from Table 2 are some blocks on Mason's Massachusetts border which are small in their Mason portion but actually quite large overall. Townsend State Forest abuts the state line south of Morse Road, and much unfragmented land lies in

[5] See Section 5.4 Unfragmented Habitat Blocks for an explanation of this number.

Ashby south of southwest Mason. Most of these areas in both Ashby and Townsend are included in Massachusetts' Squannassit Area of Critical Environmental Concern (ACEC) in recognition of the diversity of rare species found there. Mason's unfragmented landscapes form a vital part of a multi-town, multi-state spread of outstanding wildlife living spaces.

4.1.3. Wildlife Habitat Ranking

The more resources afforded by a piece of land, the more valuable it is to wildlife. We can thus rate the quality of a wildlife habit by assessing the overlapping natural elements occurring there that offer food, shelter, and water. The *co-occurrence score* for a piece of land is an indicator of how many habitat elements occur together within a given area. The map **Wildlife Habitat Ranking** shows the results of this analysis applied to Mason.[6] The following table summarizes the distribution of habitat rankings across Mason:

Table 3. Habitat Rankings in Mason

Rank (Co-Occurrence Score)	*Total Acres*	*Percent of Mason*
5	14.9	0.1
4	148.4	1.0
3	946.2	6.2
2	1,689.7	11.0
1	3,670.4	23.9

If you look at the associated map, a linear network of bright color immediately stands out. This is Mason's stream system, the many brooks and interconnected wetlands that form our town's surface water circulatory system. The lands lying along these brooks, known as riparian corridors, form Mason's highest quality wildlife habitat. The **Wildlife Habitat Ranking** map reveals that riparian corridors are a priority for wildlife habitat protection in Mason. They're also in short supply compared to other habitats, as Table 3 indicates.

Although high-ranking habitat is important, areas with only a single co-occurrence point deserve a closer look. Many are southerly slopes as shown by the contour lines. Some are farmlands and grasslands and other open lands, which are more unusual types of habitats in Mason. Other open lands include the power line right-of-way and cemeteries, which also get a co-occurrence point. All add up to a rich tapestry of habitats that feed and shelter a wonderful variety of wildlife.

Mason's widespread forests provide the basic wildlife habitat, but the co-occurrence characteristics can be crucial for wildlife at certain stages of life, enabling them to migrate, feed, mate, or nest. It's interesting to note that most of the co-occurrence characteristics for Mason are wetlands-related, with riparian corridors assigned more points due to their inter-connected network. Agricultural and other open lands, and south-facing slopes, also add to habitat value and are essential for many species.

4.1.3.1. Riparian corridors

NHWAP maps riparian corridors as a 300-foot wide buffer along the edges of perennial streams and water bodies, as shown on the **Wildlife Habitat Ranking** map. This width was chosen because it is optimal for cover for larger animals such as moose. Also, many turtle species are known to travel 300 feet from water to dig their nests. And a buffer width of 300 feet is recommended for waterfowl nesting, mink habitat, and beaver feeding [CHA99].

[6] For details about how the scores are computed, see Sec. 5.4 Unfragmented Habitat Blocks.

Although a buffer of 300 feet is considered large for regulatory approaches, a riparian corridor of this width is a goal to be aimed for when conserving land through acquisition or when siting development. Also, a riparian buffer of 100 feet wide has been found by scientific research to significantly reduce stream pollution from run-off [CHA99]. Protecting a riparian buffer along perennial streams will preserve and improve both wildlife habitat and water quality.

4.1.3.2. Wetlands

Another pattern that emerges from examining the **Wildlife Habitat Ranking** map is the widespread distribution of forested/shrub wetlands throughout the town. Even those that are small as freckles on the map add valuable diversity to wildlife habitat when they occur in clusters.

4.1.3.3. Agricultural and other open land

Farmlands, grasslands, and other open spaces such as the power line right-of-way, cemeteries and cleared areas with new growth are relatively rare types of habitats in Mason. They are ranked with a single co-occurrence point, but they are critically important for grassland birds and other wildlife which depend upon these types of open spaces.

4.1.3.4. South-facing slopes

As mentioned earlier, many of Mason's areas that receive a single co-occurrence point are south-facing slopes. Here winter turns into spring soonest, a vital factor for wildlife survival at a difficult time of year. Eric Orff, Wildlife Biologist with N.H. Fish and Game, writes in *Wildlife Reports* (2/28/2005):

> *… in southern New Hampshire, deer may spend a considerable part of the winter on these warmer inclines. Wildlife experts consider south-facing hills, with a slope of 10 degrees or more, critical habitat when mapping this state's significant wildlife habitats. These same slopes are considered preferred habitat for bobcats, as well. Even turkeys are quick to find the first green patch of south-facing field slope, laid bare by the March sun, to glean any green sprouts. Sunny south-facing slopes serve as survival spots for New Hampshire's wildlife.*

4.2. Water

Water resources are found both on the land (surface water such as streams, ponds, and wetlands) and beneath the land (groundwater that forms a water table in the pores of soil, the cracks of bedrock, and the interstices in deep deposits of sand and gravel). These two systems of surface and groundwater are interconnected. Both are fed by precipitation. On average, half the rain that falls in any given storm runs off into surface waters, and half infiltrates into the groundwater. This proportion can vary greatly depending on how much impervious surface[7] lies in a watershed. Impervious surfaces cause increased run-off which in turn can cause increased flooding, erosion, and sedimentation in surface water. Between storms, most surface waters are fed by groundwater wherever the underground water table meets the ground surface, such as in valleys and other low places.

4.2.1. Surface Water

Mason is a place where rivers begin. As seasonal streams and wetlands connect to create Mason's larger brooks, they form the headwaters of the Nissitissit and the Squannacook Rivers. Both are major tributaries of the Nashua River. Almost all of Mason lies within the Nashua River watershed. Only a small corner of northwest Mason is in the Souhegan watershed. Figure 1 shows the three major river systems (outlined in black) to which Mason contributes, and the surface waters associated with each. Tables 4 and 5 augment this map, showing stream and pond sizes.

[7] "Impervious surface" is a general term for any form of land cover (such as asphalt) that prevents rainwater from soaking into the ground.

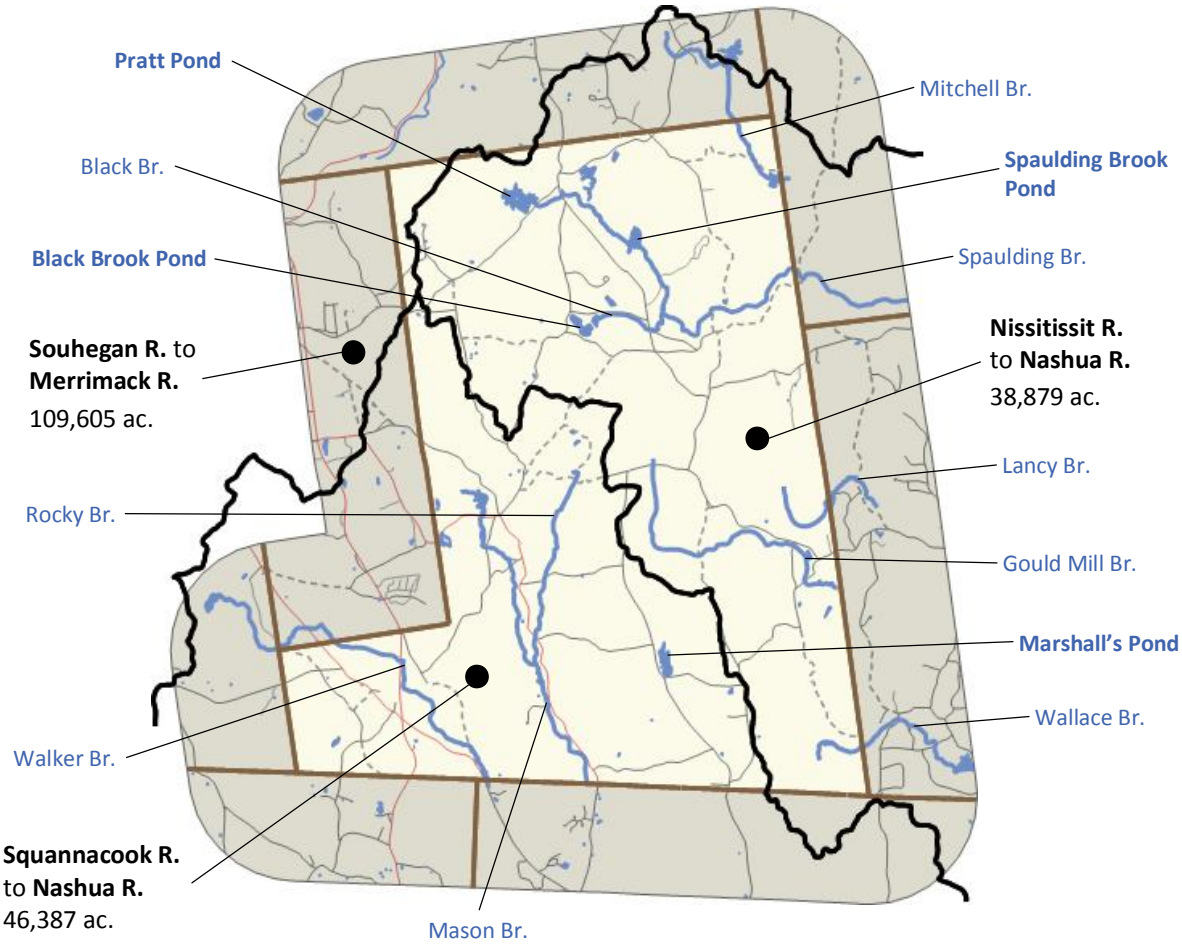

Figure 1. Mason's major watersheds, streams, and ponds.

The brooks of northern and eastern Mason feed into the Nissitissit River in Brookline, which flows out of Potanipo Pond. Spaulding Brook is Mason's largest Nissitissit headwater stream. Beginning at Pratt Pond, its tributaries are Black Brook and Mitchell Brook. Lancy Brook, Gould Mill Brook, and Wallace Brook also flow into Brookline to join the Nissitissit.

The brooks of southern and western Mason feed into the Squannacook River in Townsend, Mass. Walker Brook and Mason Brook, with its tributary Rocky Brook, are Mason's largest Squannacook headwater streams. The sizable un-named stream that flows from Marshall's Pond on Briggs Road is also a Squannacook headwater stream.

Both the Nissitissit and Squannacook Rivers are outstanding trout streams, and are classified as Source Waters by the U.S. EPA because they contribute to public water supplies (in Townsend, Pepperell, and Groton, Mass). Mason's forested landscape is an important contributor to the quality of these rivers. The Massachusetts portions of both Mason Brook and Walker Brook in West Townsend are classified by Massachusetts Fisheries and Wildlife as critical fisheries resources because they contain naturally reproducing wild trout. Their upstream portions in Mason are no less important.

Although Mason is largely a headwaters town, we do receive some drainage from beyond our borders, chiefly into Walker Brook. This stream begins at Hoar Pond in New Ipswich and passes through a relatively undeveloped landscape. However, its un-named tributary from Greenville, which flows along Route 31, experiences impacts from run-off originating in the developed areas along this highway. Water testing done for the past decade by volunteers with the Nashua River Watershed Association (NRWA) has shown high

bacteria counts in Walker Brook when sampled after rain. This Greenville tributary also brings noticeable amounts of sediment into Walker Brook.

Table 4. Mason's Major Brooks

Name	*Length in Mason (mi.)*
Spaulding	3.8
Black	0.8
Mitchell	0.9
Lancy	0.8
Gould Mill	3.0
Wallace	0.6
Mason	3.4
Rocky	2.0
Walker	2.2

Table 5. Mason's Major Ponds

Name	*Size (ac.)*
Pratt Pond	27.7
Black Brook pond	19.6
Marshall's Pond (at Briggs Rd.)	14.0
Spaulding Brook (beaver pond)	12.4

Other surface waters in Mason have not been regularly sampled but are assumed to be of good quality. Mason Brook at Jeds Lane was sampled for two seasons several years ago with the NRWA program, and found to be of good quality. N.H. Dept. of Environmental Services (DES) assumes that all surface waters meet Class B standards (fishable, swimmable) unless proven otherwise.

4.2.2. Wetlands

Wetlands are a vital part of the natural drainage, flood storage, and water filtration system. State law defines wetlands as areas "inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Mason's Wetland Conservation District Ordinance follows the state definition.

For periods of the year, many wetlands may lack surface water. But the prevalence of vegetation such as sphagnum moss, reeds, rushes, cat-tails or highbush blueberry indicates that water is not far below the surface. When storms rage and wetlands fill with water, they are doing a service for flood mitigation by storing storm waters and slowing runoff.

In general, wetlands are categorized into one of three types: emergent, scrub/shrub, or forested. These types represent different successional stages, and differ in the amount of water present and the types of plants found there. Of the three, emergent wetlands are the most biologically productive, representing critical habitat for a wide variety of animals. Table 6 (next page) shows the frequency of each wetland type within Mason. Note that in total, wetlands account for less than four percent of Mason's area[8].

Since Mason has very few mapped floodplains (FEMA maps show small areas along Mason Brook near the Townsend line and along Gould Mill Brook near the Brookline line), wetlands are Mason's chief line of defense for absorbing floodwaters.

The vegetation in wetlands acts to filter runoff, which helps streams retain their quality. But wetlands' filtration abilities can be overwhelmed when runoff from adjacent developed areas brings in quantities of sediment and other pollutants. Research has shown that protecting wetlands with naturally vegetated buffers significantly reduces impacts from runoff [CHA99]. At present, Mason's Wetlands Ordinance lacks buffers.

[8] According to data from the National Wetlands Inventory, http://www.fws.gov/wetlands/.

Table 6. Mason's Wetlands by Type (NWI)			
Type	*Size (ac.)*	*Percent of Wetlands*	*Percent of Mason*
Emergent Wetlands	83.5	15.8	0.5
Scrub/Shrub Wetlands	100.0	19.0	0.7
Forested	343.2	65.2	2.2
Total	526.7	n/a	3.4

Mason has several types of wetlands, ranging from sizable marshes to small vernal pools (crucial for amphibian survival). The largest wetlands in town (Table 7) are grassy marshes and shrub swamps.

Table 7. Mason's Largest Wetlands			
	Location	*Description*	*Size (ac.)*
A	Townsend Rd., Briggs Rd., Hurricane Hill Rd.	Shrub swamp system, draining west to feed Mason Brook headwaters and south into Townsend State Forest.	175.3
B	Campbell Mill Rd.	Marsh-shrub swamp system connected with Gould Mill Brook.	90.6
C	Merriam Hill Rd.	Marsh, shrub swamp, and beaver flowage connected with Mason Brook	52.1
D	Brookline Rd., Babb Meadow Rd.	Babb Swamp connected with Lancy Brook	48.5
E	Abbott Hill Rd.	Marsh, shrub swamp and beaver flowage connected with Spaulding Brook.	41.2

Wetlands B and D are near Mason's border with Brookline. If studies were undertaken to designate Prime Wetlands for Mason, any of the above wetlands might be candidates. Prime Wetlands are defined in NH RSA 482-A:15 as those "because of their size, unspoiled character, fragile condition, or other relevant factors, make them of substantial significance." For Prime Wetland designation, mapping and documentation and a Town Meeting vote of acceptance are required.

Mason's most unusual wetlands are peatlands, acidic bogs occurring on only half a percent of Mason's area. The most prevalent wetlands are forested wetlands, usually in the form of red maple swamps. Most wetlands are found in low-lying areas but sometimes they occur on slopes where water seeps to the surface due to hardpan or shallow bedrock soils.

4.2.3. Groundwater

Mason's residences and businesses depend on their groundwater wells for water supply. As Figure 2 shows, the quantity of water available for wells varies greatly throughout town. Not everyone is fortunate to tap into underground aquifers. Aquifers are geologic formations that can yield water at a rate sufficient to sustain highly productive wells.

The most productive aquifers are deep sand and gravel deposits known as stratified drift aquifers. These have been mapped by U.S. Geological Survey. Most stratified drift aquifers in Mason are of medium depth (around twenty feet) and are considered medium yield. Mason's largest medium yield aquifer lies in the north-central

part of town in the Spaulding/Black Brook watershed. Mason's only area of high yield aquifer lies near the Brookline line in the Gould Mill Brook watershed.

Bedrock fractures, if large and numerous, are another form of aquifer. However, little is known about the location of bedrock fractures that can yield sufficient water to be aquifers for community water supplies. Most bedrock in Mason has enough fractures to support household wells, if users are careful.

But some parts of Mason are not brimming with groundwater readily available for household supply. An analysis of the 280 recorded wells in Mason (see Figure 2) indicates that forty-four wells yield only two gallons per minute, half of the state's recommended minimum flow rate for domestic wells. Eleven of these low-yielding wells have had to be drilled to depths of 1,000 feet and more.

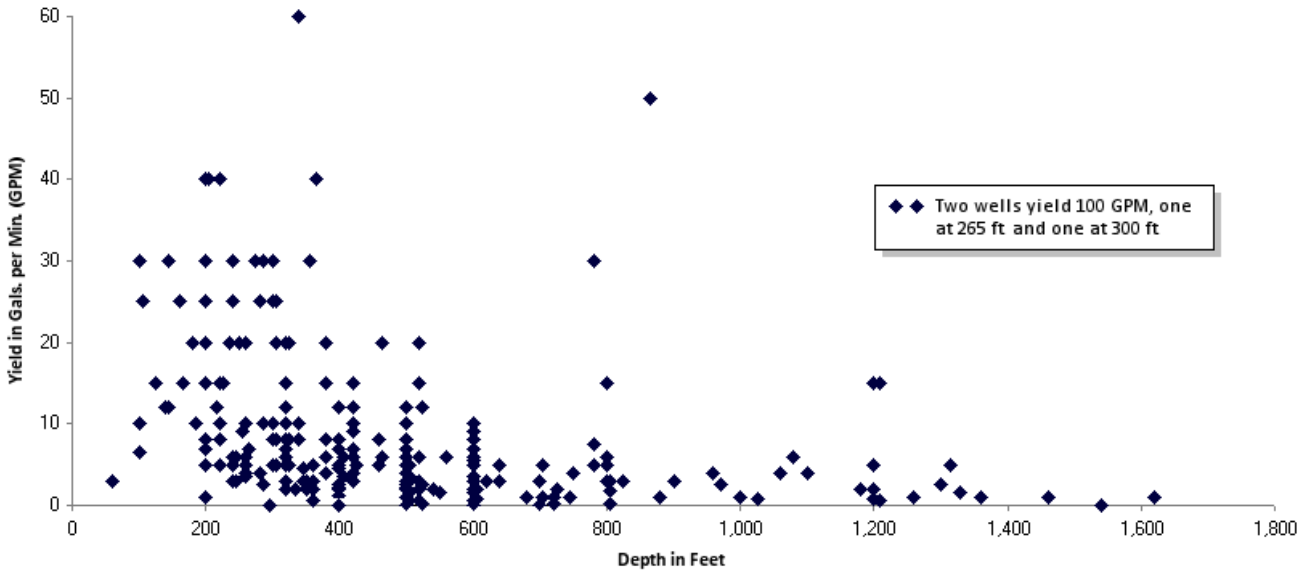

Figure 2. Yield versus depth for water wells recorded between 1984 and 2011.

The deepest well in Mason at 1,600 feet yields only one gallon per minute. On the other end of the yield curve, two "gushers" of 100 gallons per minute have been drilled in Mason at opposite ends of the town. One is on Withee Brook Road, one is on Route 31. For bedrock wells in Mason, there so far seems to be little connection between location and yield. Science has not yet surpassed the art of the dowser.

Because water in bedrock fractures and stratified drift aquifers is fed by infiltration from the soil layers above, land uses affect water quality. Groundwater in Mason has been contaminated from abandoned leaking underground tanks at the intersection of Routes 31 and 124, now cleaned up. The fueling station at Mason Highway Department contaminated groundwater before it was constructed with a roof and impervious surface at the pumps. Over a few years, the groundwater has become clean again here. Manure, when left in large uncovered piles, can pollute groundwater with bacteria. Residences with malfunctioning septic systems can pollute their own wells. Even well-functioning septic systems cannot treat many household chemicals. What goes down the drain to a septic system can affect the groundwater.

4.3. Soils

Not simply "dirt", soil is that basic substance that determines the suitability of land for various uses. The drainage characteristics of soil (see Table 9 on next page) are key to land use. These range from very poorly drained (wetlands, best left alone) to well drained (productive for farming and forestry) to excessively drained (sands and gravels useful for construction but not for crops). Within Mason's rolling topography, many types of soils can be found, sometimes within a relatively small area.

Table 9. Soil Acreage by Drainage Class		
Class	*Total Acres*	*Percent of Mason*
Excessively drained	1,201.8	7.8
Somewhat excessively drained	37.5	0.2
Well drained	12,104.9	78.8
Moderately well drained	528.7	3.4
Poorly drained	993.8	6.5
Very poorly drained	524.9	3.4

As with all New England, Mason's soils were laid down as the great ice sheet melted 12,000 years ago. This mile-thick glacier stretched down from Canada, scraping the bedrock, picking up boulders, crushing and mixing them. As the climate warmed, the melting glacier dropped this material as rocky till on the hillsides, and its melt waters carried huge quantities of sand and gravel into the valleys. ([HAN01], page 2)

Mason is included in the Western Part of *Soil Survey of Hillsborough County, New Hampshire, Western Part* [HAN01] because it is an upland town, considered by soil scientists to have more frigid soils, where frost stays in the ground longer than in adjoining lower-lying towns such as Brookline and Milford. Throughout Mason's uplands, areas of bedrock occur quite close to the surface, with very little soil covering. This lack of soil can make for severe limitations on construction, farming, forestry, and road-building.

Two of the accompanying maps show Mason's soil resources: **Forest and Farmland Soils** and **Hydrologic Resources**. The map **Forest and Farmland Soils** shows soils by forest productivity class (five levels) and the two highest levels of farmland quality: Prime Farmland and Farmland of State-wide Importance. Prime Farmland soils are fine sandy loams, with few or no stones, flat to gently sloping (no more than 8% slopes). Statewide important farmland is often found near prime farmland. It is somewhat stonier (but not very), and more sloping (up to 15%), and can be neither excessively nor poorly drained. For more detail, see *New Hampshire Soil Attribute Data Dictionary* [NRCS02], pages 11 & 12.

Unsurprisingly, prime and statewide important farmland soils occupy only a small percentage of Mason's area (see Table 10, next page), scattered through most of the town outside of northeastern Mason. Some larger patches of prime farmland (perhaps twenty acres in size) are on the western edge of Mason: Nutting Hill Road, along Greenville Road, and near the Greenville border back in the forest on the Bronson Potter Homestead land. Other sizable patches are on Starch Mill Road (two), Brookline Road (three) and Gilman Hill Road.

In southwest Mason are several smaller prime farmland patches associated with statewide important farmland. Here we find Barrett Hill Farm, Birchwood Orchards, Hungry Bear Farm, and Hidden Meadow Farm. Much of Mason's best farmland soils have reverted to forest or become developed. But many of Mason's homes from colonial times are still surrounded by fields or pastures. Mason's village center is sited on a patch of farmland soils. Those old Yankee farmers knew what they were about.

Table 10. Soil Acreage by Farmland Class		
Class	*Total Acres*	*Percent of Mason*
All areas are prime farmland	493.8	3.2
Not prime farmland	9,515.7	62.0
Farmland of local importance	4,997.5	32.6
Farmland of statewide importance	478.6	3.1

The forest soil groups are graded by their ability to grow trees and the ease of timber harvesting. The top three groups, IA, IB, and IC vary in loaminess and fertility from IA the most loamy and fertile to IC the most sandy and less fertile. Both IA and IB favor hardwood growth, IC is well suited to softwood production. Hardwoods out-compete pine on the more fertile soil groups, more intensive forest management is required to control hardwoods and encourage pine on these soils.

Table 11. Soil Acreage by Forest Soil Group

Forest Soil Group	*Total Acres*	*Percent of Mason*
Group IA	1,627.7	10.6
Group IB	7,858.6	51.2
Group IC	960.2	6.2
Group IIA	3,422.5	22.3
Group IIB	993.8	6.5
Not forest soil	622.8	4.1

Difficulty of forest management and harvesting characterizes forest soil groups IIA and IIB. Group IIA soils include many of the same soil types as group IA but they are steeper and more rocky. Group IIB soils are poorly drained and so limited to being harvested when the ground is frozen. See Sec. 5.1 Forest Soil Groups for more details about forest soil groups.

The map **Forest and Farmland Soils** shows forest soil group IB to be the most prevalent type throughout Mason. This accords with the observation that mixed hardwood forests are more common than conifer forests in Mason. A sizable area of group IC soils lies in a swathe along Sandpit Road (not surprising), in the vicinity of the medium-yield sand and gravel aquifer. Group IA, the most fertile type, is found in scattered but sizable patches throughout Mason. It is encouraging to discover that productive forest soil groups predominate in Mason.

The largest areas of Group IIA soils, more difficult to manage and harvest, lie in the rugged terrain of northern Mason, although several sizable patches are found in all corners of the town. Group IIB soils, the most unfavorable for forest management, are generally located in wetland areas.

The map **Hydrologic Resources** shows the soils by drainage class. As the map shows, the most prevalent soils in Mason are well drained. However, these well drained soils are not homogeneous; numerous small forested/shrub wetlands are sprinkled within the areas mapped as well drained soils, particularly in the northwestern and central parts of Mason.

Areas of poorly and very poorly drained soils are found along Mason's network of brooks. These types of soils form wetlands. Mason Brook, Rocky Brook, Gould Mill Brook, Lancy Brook, Spaulding, Black, and Mitchell Brooks all flow through extensive stretches of these poorly drained soils. A sizable area of these soils accompanies the unnamed stream that flows from Marshall's Pond in the vicinity of Briggs Road, Townsend Road, and Hurricane Hill Road.

At the other end of the spectrum are excessively drained soils, the sands and gravels. When these soils extend deeply below the water table, they form aquifers which can be significant sources of groundwater. Mason's largest areas of excessively drained soil lie in the north central part of town around Sand Pit and Russell Roads, and near Mason's southeastern edge from Brookline Road to Townsend. A sizable area of these excessively drained soils along Brookline Road is mapped as a high yield aquifer. Much of the excessively drained soils in the north central area are mapped as a moderate yield aquifer by U.S. Geological Survey.

A concern with excessively drained soils is that due to their high transmissivity, pollution that enters the groundwater can travel relatively quickly in these soil types. That is why Mason septic system siting regulations require a setback of 100 feet from wetlands for systems located in excessively drained soil, rather than the 75-foot setback required for other soil types.

An understanding of soil character is key to wise land use. An awareness of the scarcity of high quality farmland in Mason should encourage the protection of what we have. The predominance of good quality forest soil types throughout Mason indicates that our town has excellent potential as a place for productive long-term forest management.

Underlying sizable areas of Mason's soils (sometimes near the surface) is a massive formation of dense fine-grained gray biotite granite bedrock. Since the arrival of colonial settlers, this granite has been sought after and used as a building material. Historically, it was one of Mason's economically important natural resources, from the early hand-hewn foundation stones to the massive monuments created from the old MacDonald Company's Mason Quarry off Scripps Lane. A century ago, this was a populous working village. Now the privately-owned quarry site is a beautiful woodland pond. Even in this era of concrete, intermittent stone quarrying takes place in Mason at the former Fletcher Granite Quarry off Starch Mill Road. Mason granite is still a quality building material.

4.4. Forests and Agriculture

Forestry and agriculture are economic activities that depend on the natural resources of soil and water. Moderately well-drained soils are the best foundation for growing both trees and farm crops. But trees can tolerate rockiness much better than farm crops, which is why most of Mason is now forested. More than a century ago, the landscape was quite opposite—80% of the countryside was cleared. Even then, at the height of Mason's agrarian era, most of this cleared land was in pasture or hay, not tilled crops. Miles of stone walls in the woods mark former pastures grazed by sheep and cattle.

Agriculture continues, although in a smaller way. Though horses may now be more prevalent in Mason than cows and sheep, the owners of all these types of animals keep pastures open, and buy or raise hay, supporting agricultural enterprises. Pleasant fields along Valley Road, Greenville Road, Jackson Road, Churchill Road, Barrett Hill Road, and on Nutting Hill feed animals today.

Large tracts of prime and important farmland soils are rare in Mason. The most intensive agriculture takes place in southwest Mason, thanks to the fact that here a sizable area of important farmland soils is owned by enterprising people skilled in agriculture. Apples, strawberries, sweet corn, and numerous other crops are grown in this area of town. Farm stands on Route 31 and Route 124 are important venues for marketing the local produce. Any commercial zoning which may be contemplated for this part of Mason should be designed to complement the farm businesses of this area.

Indeed, Mason's largest private employers, Parker's Maple Barn and Pickety Place, are businesses based on agricultural products originating locally—maple syrup and herbs. Small scale farming forms a basis for many home businesses in Mason: maple syrup production, eggs, chickens and pigs, berries, keeping bees, making goat's milk soap. Two sizable plant nurseries are operating in Mason, raising plants for landscaping and gardening.

When the Mason Conservation Commission develops management plans for the town's conservation lands, one of the options for sites where prime farmland soils occur may be to lease this acreage to interested farmers who agree to follow best management practices.

Mason has excellent potential as a place for productive long-term forest management. As the Forest and Agricultural Soils Map shows, good quality forest soil types predominate in Mason. The forests of the Monadnock region are outstanding for a diverse mix of tree species, being in a transitional zone where northern hardwoods and conifers (beech, birch, sugar maple, hemlock) mingle with more southern types (oak

and pine). Mason's forests share in this diversity. They have a much higher percentage of Appalachian Oak-Pine forest than is typical for New Hampshire, whose forests are largely Hemlock- Hardwood-Pine south of the White Mountains.

Forests provide so many benefits—clean water (forested watersheds produce the best quality water), food and shelter for a wide array of wildlife, material for building people's homes and other useful items, fuel for heat, and income for landowners. When they are harvested sustainably, New England's well-managed forests continue to grow back on their own; no need to plant trees for future harvests.

Mason's "Intent to Cut" timber yield tax forms give an estimate[9] of the timber harvest in Mason over the past eighteen years (1993 – 2011). The data shows that a tremendous quantity of timber has been harvested throughout town during this time – more than 22.3 million board feet of softwoods and hardwoods, plus 105,500 tons of pulp and chips, and over 10,000 cords of fuel wood. (See Figure 3, Figure 4, and Figure 5 on page 19) Timber yield tax entries in the Town Reports from 1993 to 2010 (see Figure 6 on page 20) indicate that the stumpage value of Mason's timber harvest during these years would total $4,074,740, based on the 10% yield tax.

All this timber came from only 6,700 acres, or less than 44% of Mason's area. On an annual basis, 22.3 million board feet harvested over eighteen years comes to a cutting rate of 185 board feet per acre per year. For a managed forest, this is a very sustainable level of harvesting. Jonathan Nute, Hillsborough County Extension Forester, states that managed forests in this part of New Hampshire grow at a rate of 500 board feet per acre per year, because the previous harvests have given the remaining trees room to grow faster [NUT12].

However, unmanaged forests in this part of New Hampshire grow at a rate of only 167 board feet per acre per year [NUT12]. For forest parcels that have been too heavily cut, ignored, or cut at too frequent intervals, Mason's annual harvest rate of 185 board feet per acre might not be sustainable.

Properly managing a forest can make a three-fold increase in yield. For any forest parcel, both Mr. Nute and Bill Downs, Mason's Town Forester, recommend harvesting approximately 30% of the basal area (square footage of trees) with at least 20 year intervals between harvests. To maximize growth in a mixed forest, it is recommended to leave a basal area of 100 square feet per acre of trees after harvesting. This results in a well-stocked forest that maintains a good rate of growth. When the basal area reaches 130 square feet per acre, it's time to harvest again [BEN10].

The forests in Mason today lack grandeur but they are rugged survivors, grown back from the massive clear-cutting of the early 1800s, and cut several more times in the following century. In the early to middle twentieth century, a driver of heavy harvesting in this region was New England Box of Townsend, Mass., a factory which built wooden boxes until the mid 1950s. Their intensive timber cutting may have contributed to the dense mountain laurel understory that interferes with forest growth around this region on both sides of the state line.

Most of the large parcels of town-owned conservation land were timbered by previous owners in the late 1990s and early 2000s. This includes much of Bronson Potter's gift of 568 acres, the Mitchell Brook Conservation Land (283 acres), and the Mitchell Hill Conservation Land (100 acres). In 1998, Town Forester Bill Downs oversaw a selective cut at the Beck and Jefts Conservation Lands, 70 acres on Scripps Lane. Keeping to the recommended interval between harvests of at least 20 years, further timber cutting on these conservation lands is discouraged until 2020.

[9] Because the yield tax is levied on the basis of these figures, some may under-estimate the actual harvest.

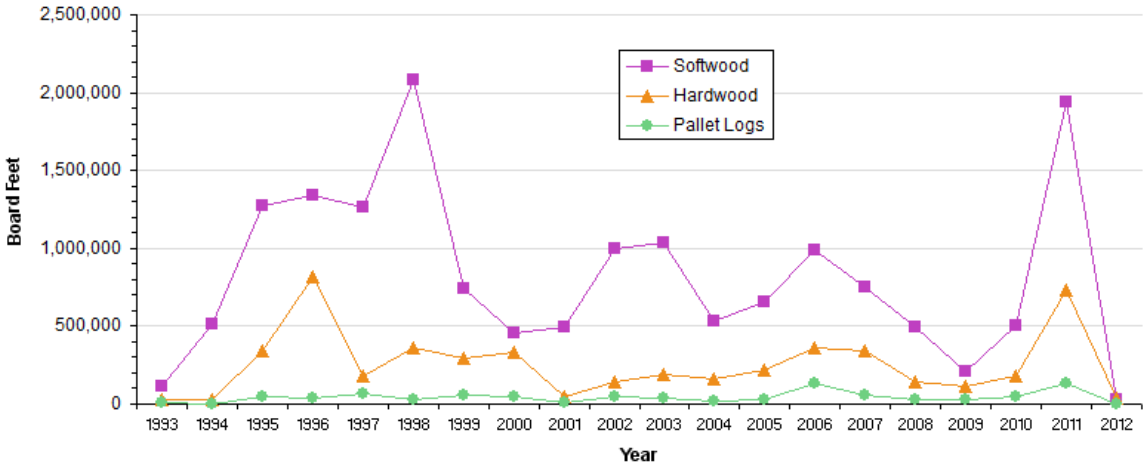

Figure 3. Timber harvest 1993 to 2012.

Figure 4. Pulp harvest 1993 to 2012.

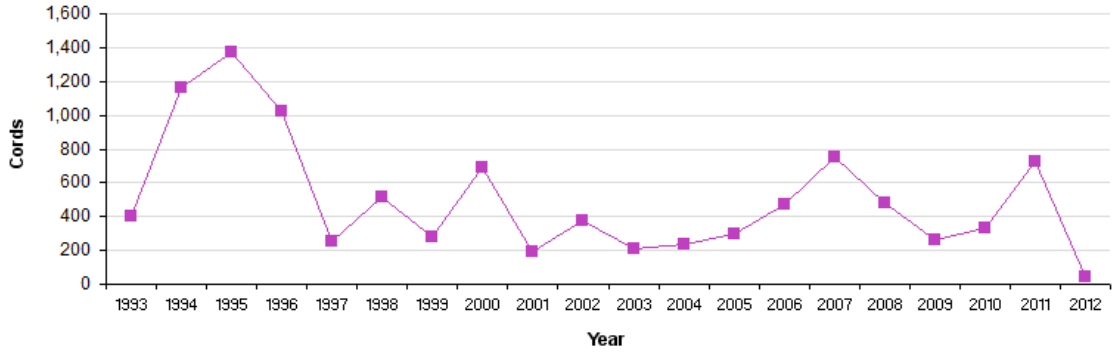

Figure 5. Cordwood harvest 1993 to 2012.

Mason's Master Plan sets forth this conservation goal: "Encourage sustainable forestry as a long term land use for large parcels" [MAS07]. With good forest management townspeople can eat their cake and have it too, sustainably harvesting timber forever while enjoying Mason's forests for outdoor recreation, wildlife habitat, and water quality protection. The Mason Conservation Commission hopes that the data provided in this Natural Resources Inventory will encourage this outcome.

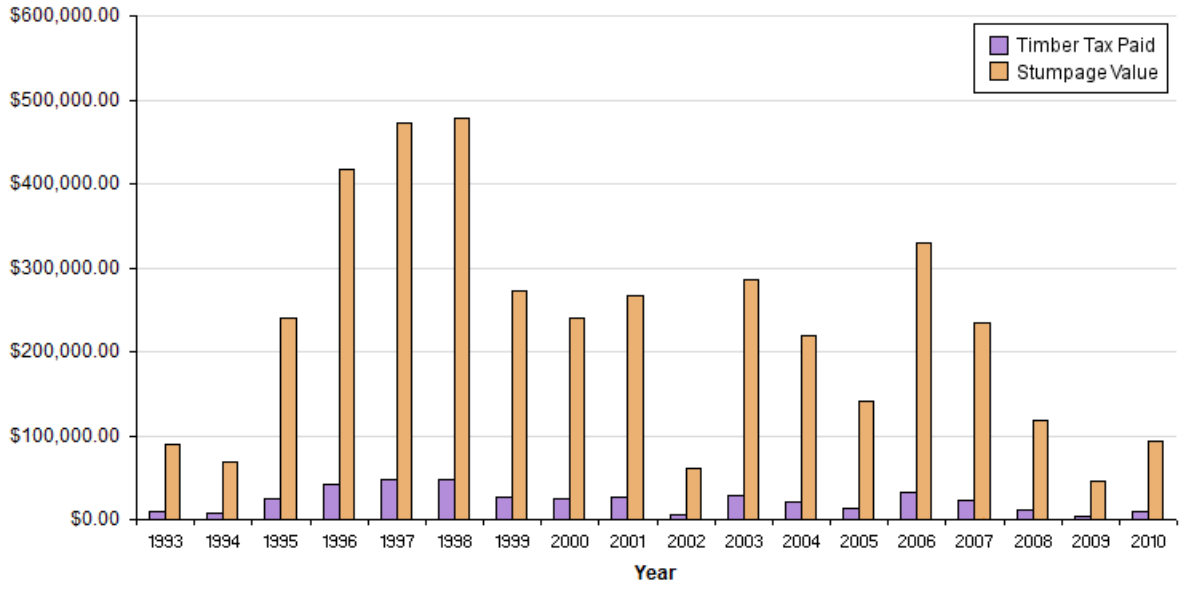

Figure 6. Total timber tax and value 1993 to 2010.

4.5. Trails and Recreation

Mason's natural resources provide opportunities for many types of outdoor recreation. Our town's forested hills, brooks, ponds and other wetlands offer places for trail activities, fishing, hunting, and even boating for cartop-sized craft.

Our town's trails are Mason's chief open space recreation facilities. The spine of Mason's trail system is the town-owned Mason Railroad Trail, whose 6.7 miles cross the entire town from north to south, linking Russell Abbott State Forest in the north to Townsend State Forest in the south. Many types of recreational users frequent the Mason Railroad Trail: hikers, horseback riders, snowmobilers, joggers, mountain bikers, cross-country skiers, and dogsled trainers. ATVs are not permitted on the Railroad Trail or on town conservation lands, due to the erosion and noise problems they create. User groups such as the local horseback riding club MANE (Mason Area Neighborhood Equestrians) and regional snowmobile clubs such as the Wilton-Lyndeborough Winter Wanderers, have been helpful in maintaining the RR Trail and other trails as well.

Trails in Russell Abbott State Forest connect with the RR Trail, as do some of Mason's unmaintained town roads (Class 6) such as Coyne Lane and Scripps Lane. These two old Class 6 woods roads, designated as Scenic Roads, make fine, seldom-trafficked wilderness trails. However, a portion of Scripps Lane near Brookline Road was lost as a trail when it was upgraded to Class 5 status; this has led to problems with inappropriate vehicle use on the RR Trail. Figure 7 shows the primary recreational areas within and near Mason.

Mason's 9.5 miles of old Class 6 roads offer great backcountry trail recreation. In the northern part of town, Mitchell Hill Road's Class 6 and discontinued sections connect with trails on the Fifield Tree Farm Conservation Easement and the town's Mitchell Hill Conservation land. In the western part of town, Walker Brook Road connects with the trout stream of that name, and Reed Road connects with New Ipswich and Ashby, Mass. In Mason's southeast corner, Lost Valley Road winds its way to Brookline. Old Mill Road makes for a pleasant stroll near the town center.

Because they are public rights of way, Class 6 roads can be used by vehicles but their unmaintained rough tracks limit the amount of vehicle traffic, making them safer for recreational users. If more of Mason's Class 6

roads become upgraded to Class 5 town-maintained roads, this would be a loss for outdoor recreation as well as diminishing Mason's rural character.

Trails on public conservation lands make an extensive network for exploring Mason's countryside, but are not linked throughout the town. Creating an inter-connected town-wide trail system is a goal worth considering. Thanks to Bronson Potter's gift of 567 acres in the northern and central parts of Mason, two pieces of a town-wide system are in place.

In the north, trails on the former Bronson Potter homestead at the Greenville line connect with trails near Bronson's view fields on Greenville Road. From here, the "Bear Trail" descends to Class 6 Old Brookline Road (it may cross some private lands) connecting to Wilton Road.

In central Mason, the Bronson Potter trail begins at Merriam Hill Road near the Greenville line, and winds around the hill to Old Ashby Road. Nearby on Old Ashby, Class 6 Old Mill Road leads to Cascade Road near Valley Road (Route 123). Across Route 123 lies the Florence Roberts Forest. However, its trail-head is about a quarter-mile up Route 123, a difficult road for trail use.

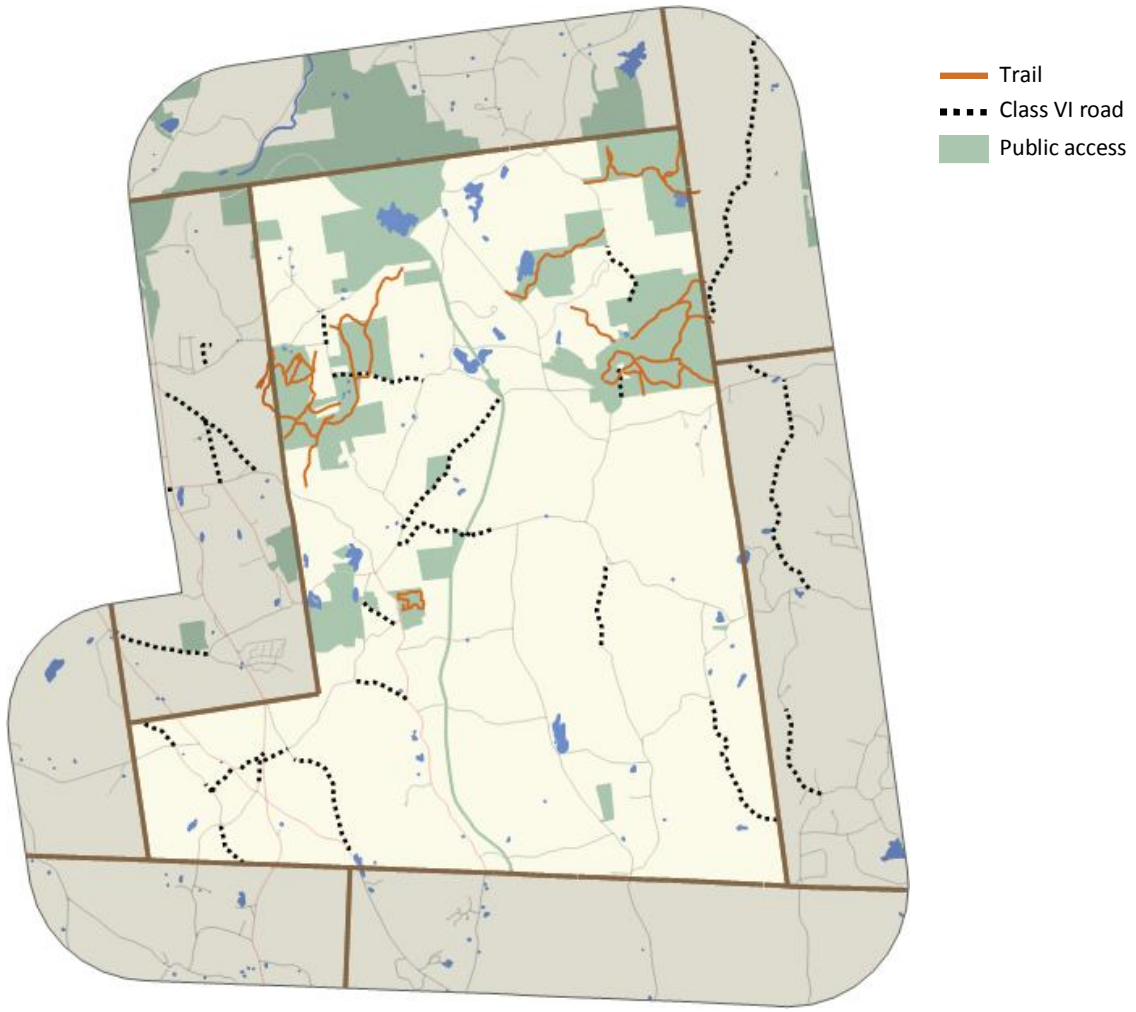

Figure 7. Recreation areas within and near Mason.

In north-central Mason near the power line crossing on Starch Mill Road, the Spaulding Brook Conservation Land has a trail that crosses Spaulding Brook and goes up to join Mitchell Hill Road. About a quarter mile north

on Mitchell Hill, the trail heads downhill on the Mitchell Brook Conservation Land to follow the Mitchell Brook valley into Milford, where it connects with trails on Milford's 400+ acre Mile Slip Wilderness. Altogether here is a 2 3/4 mile trail route from Starch Mill Road to Milford largely on conservation lands, passing by a lovely pond and over some interesting terrain. However, roadside parking at the power line on Starch Mill Road cannot fit more than 2 cars safely.

As Figure 7 makes clear, very little conservation land exists in the southern part of Mason. Here as in other parts of town, an informal network of trails exists on private land, accessed by neighbors and friends. Such trails cannot be mapped. Whether public or private, recurring ice storms, wind storms, and heavy snow make keeping trails clear a continual need. Mason Conservation Commission is grateful to all the clubs and individuals who help out.

Hunting and fishing are also popular forms of recreation in Mason's open spaces. Hunting requires large blocks of open space such as exist in northern Mason at Russell Abbott State Forest, and the town's Mitchell Brook and Spaulding Brook Conservation Lands. Large blocks of open space are vital to allow for safe hunting, an important means to prevent deer from over-populating.

Retaining large blocks of open space is also essential for stream quality. Mason' perennial streams (Black, Spaulding, Lancy, Gould Mill, Wallace, Mitchell, Mason, and Walker Brooks) generally support brook trout. Anglers have enjoyed good luck in the Rocky Brook pond next to the Fire Station. Mason Brook and Walker Brook in Massachusetts are both classified as coldwater fisheries resources, where trout reproduction has been confirmed. The New Hampshire stretches of these brooks are likely to have naturally reproducing trout also.

Warmwater fisheries are found in Mason's ponds, particularly Pratt Pond at Russell Abbott State Forest. Spaulding Brook Pond and the ponded areas of Black Brook and Mason Brook are also likely to have warmwater fish populations, as indicated by the presence of otters from time to time.

Boating with small craft such as kayaks or canoes would be possible on the ponds that have public access. Pratt Pond is always accessible, for boating In warm seasons and ice skating or cross-country skiing and snowmobiling when the ice is thick enough. If beavers are active, boating may be possible on the ponded part of Mason Brook in the marsh on Merriam Hill Road, accessed at the Cliff Hastings Nature Trail Land.

Swimming is not recommended at any of Mason's ponds. Pratt Pond has leeches, and the other ponds are beaver flowages, which can be sources of water-borne illnesses such as giardia.

Nature study can be a very satisfying form of outdoor recreation in all seasons, rewarding for expert and amateur alike. When there is good snow cover for following the animals' tracks, no trails are needed, just snowshoes for following the animals' traces as they go about their lives. Nature study reveals how Mason's forests, fields, ponds, brooks and swamps are homes to all sorts of creatures that share our world.

Table 12. Mason's Major Public Recreation Areas		
Area	*Access*	*Uses*
Russell Abbott State Forest Includes Pratt Pond and old Starch Mill ruins.	Pratt Pond Rd, Starch Mill Rd.	Hunting, fishing, hiking, canoeing, snowmobiling, horseback riding. OHRVs prohibited due to trail and wetland damage.
Mason Railroad Trail Unpaved—surface is gravel or coal dust.	Pratt Pond Rd, Wilton Rd, Russell Rd, Sandpit Rd, Depot Rd, Jackson Rd, Morse Rd.	Hiking, jogging, horseback riding, snowmobiling, X-C skiing, dog-sledding, mountain biking. OHRVs prohibited.
Bronson Potter Conservation Lands	Greenville Rd, Old Ashby Rd, Merriam Hill Rd.	Non-motorized open space uses. Land management study needed to determine other appropriate uses. OHRVs prohibited.
Spaulding Brook Conservation Land	Starch Mill Rd, Mitchell Hill Rd.	Hunting, fishing, hiking, horseback riding, snowmobiling. OHRVs Prohibited.
Mitchell Brook Conservation Land	Mitchell Hill Rd.	Hunting, fishing, hiking, horseback riding, snowmobiling. OHRVs prohibited.
Florence Roberts Forest	Valley Rd. near Cascade Rd.	Hiking, horseback riding, geo-caching. OHRVs prohibited.

5. Appendix I—Technical Terms and Definitions

5.1. Forest Soil Groups

Forest soil groups classify soils by the types of tree species likely to grow there and for the area's potential for commercial production of forest products. That latter is mainly a matter of how costly or difficult it is to harvest the timber.

The following is taken from *New Hampshire Soil Attribute Data Dictionary* [NRCS02].

Group IA This group consists of the deeper, loamy textured, moderately well, and well-drained soils. Generally, these soils are more fertile. The successional trends on these soils are toward stands of shade tolerant hardwoods, i.e., beech and sugar maple. Successional stands frequently contain a variety of hardwoods such as beech, sugar maple, red maple, white birch, yellow birch, aspen, white ash, and northern red oak in varying combinations with red and white spruce, balsam fir, and occasionally white pine and hemlock. Hardwood competition is severe on these soils. Softwood regeneration is usually dependent upon persistent hardwood control efforts. That is, without frequent hardwood cutting, softwoods can't compete here and thus are rare.

Group IB The soils in this group are generally sandy or loamy over sandy textures and slightly less fertile than those in group IA. Soil moisture is adequate for good tree growth, but may not be quite as abundant as in group IA soils. Soils in this group have successional trends toward a climax of tolerant hardwoods, predominantly beech. Successional stands, especially those which are heavily cutover, are commonly composed of a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, sugar maple, and beech, in combinations with red spruce, balsam fir, and hemlock. Hardwood competition is moderate to severe on these soils. As with group IA, successful softwood regeneration is dependent upon hardwood control.

Group IC The soils in this group are outwash sands and gravels. Soil drainage is excessively drained to moderately well drained. Soil moisture is adequate for good softwood growth, but is limited for hardwoods. Successional trends on these coarse textured, somewhat droughty and less fertile soils are toward stands of shade tolerant softwoods, i.e., red spruce and balsam fir. Balsam fir is a persistent component in many stands (in northern N.H.), but is shorter lived than red spruce. White pine, red maple, aspen, and paper birch are common in early and mid-successional stands. Hardwood competition is moderate to slight on these soils. Due to less hardwood competition, these soils are ideally suited for softwood production. With modest levels of management, white pine can be maintained and reproduced on these soils. Because these soils are highly responsive to softwood production, especially white pine, they are ideally suited for forest management.

Group IIA This diverse group includes many of the same soils as in groups IA and IB. However, soils in this group have physical limitations that make forest management more difficult and costly, i.e., steep slopes, bedrock outcrops, erosive textures, surface boulders, and extreme rockiness. Usually productivity of these soils is not greatly affected by their physical limitations. However, management activities such as tree planting, thinning, and harvesting are more difficult and more costly. Due to the diverse nature of this group, it is not possible to generalize about successional trends or to identify special management opportunities.

Group IIB The soils in this group are poorly drained. The seasonal high water table is generally within 12 inches of the surface. Productivity of these poorly drained soils is generally less than soils in other groups. Successional trends are toward climax stands of shade tolerant softwoods, i.e., spruce and balsam fir. Balsam fir is a persistent component in stands in northern New Hampshire. Due to abundant natural reproduction in northern New Hampshire, these soils are generally desirable for production of spruce and balsam fir, especially pulpwood. However, due to poor soil drainage, forest management is somewhat limited. Severe windthrow hazard limits partial cutting, frost action threatens survival of planted seedlings, and harvesting is generally restricted to periods when the ground is frozen.

Group NC Shown on the maps as "Not forest soils." Actually means "Not Considered" for ranking because these areas are either highly variable or have a limited potential for commercial production of forest products. (Most areas that are wet year round fall into this classification.) An on-site visit is required to evaluate each area given this ranking.

5.2. Agricultural Soil Types

USDA defines several categories of farmland [NRCS] (categories irrelevant to Mason are omitted from this list):

Prime farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding.

Farmland of statewide importance

Land that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Criteria for defining and delineating this land are to be determined by the appropriate state agency or agencies. Generally, farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable. In some states, additional farmlands of statewide importance may include tracts of land that have been designated for agriculture by state law.

Farmland of local importance

In some local areas, there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. Where appropriate, these lands are to be identified by the local agency or agencies concerned. In places, additional farmlands of local importance may include tracts of land that have been designated for agriculture by local ordinance.

From these categories, soil areas are classified by how closely they align with these criteria. Seven such classifications are relevant to Mason:

1. All areas are prime farmland.
2. Farmland of local importance.
3. Farmland of statewide importance.
4. Not prime farmland.
5. Prime farmland if protected from flooding or not frequently flooded during the growing season.
6. Prime farmland if drained.
7. Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season.

In the "Forest and Farmland Soils Map," crosshatching distinguishes areas of types 1 and 2. Other types are less important for resource management and are thus omitted from this map.

5.3. Habitat Co-Occurrence Scores

Wildlife habitat quality is ranked according to a point system known as a "co-occurrence score." What's "co-occurring" are desirable habitat characteristics as described in the following table:[10]

Habitat Co-Occurrence Characteristics		
Characteristic	*Point Value*	*Notes*
Riparian corridors	2	A 300-foot buffer around perennial streams and surface water .
Palustrine Emergent (PEM) Wetlands	1	"Palustrine" refers to the general category of wetlands traditionally called by such names as marsh, swamp, or bog. The group also includes the small, shallow, permanent or intermittent water bodies often called ponds.[11] Within the palustrine category, emergent wetlands are very wet areas dominated by grass-like water-loving plants, often bordering a pond, lake, or stream. Typical emergent wetland vegetation includes cattails, rushes, sedges, willow, and duckweed. Animals found in the emergent wetlands include muskrats, red wing blackbirds, several species of frogs, salamanders, green herons, great blue herons, and many duck species.
Wetlands larger than 5 ac.	1	Large wetlands are, in general, more productive than their smaller counterparts.
Clusters of wetlands less than 5 ac.	1	Three or more wetland areas less than 5 acres in size, within 1 kilometer of each other, and within the same unfragmented habitat block. Studies show that clusters of small wetlands support a great diversity of wildlife species.
Agricultural and other open land	1	Includes row crops, and disturbed or cleared land, and early successional areas. An increasingly rare habitat in N.H.
South-facing slopes	1	Slopes greater than 10% and facing SW/S/SE.

To compute the score for some region, the area is divided into a grid of squares 93.5 feet[12] on a side (roughly 1/5 acre). Then the score for each grid cell is computed by summing the points applied from the preceding table.

Categories and associated point values were determined by N.H. Fish & Game as a precursor to the N.H. Wildlife Action Plan.

5.4. Unfragmented Habitat Blocks[13]

An "unfragmented habitat block" (or just "unfragmented block") is an area of land not subdivided by development or by natural features (such as large rivers) that would block wildlife movement. (Mason has no such large natural features.) The presence of development is indicated by paved roads. (Dirt roads are not considered impediments to wildlife). In other words, paved roads divide Mason's land into a collection of unfragmented blocks. Unfragmented blocks are important because many animals species (especially large mammals and many birds) require uninterrupted expanses of land for feeding and breeding ranges. Also, road crossings are well-known hazards to wildlife.

[10] Characteristics irrelevant to Mason, such as salt marsh, are omitted from the table.

[11] [COW79]

[12] It's unclear why the grid size of 93.5 feet is used. The information obtained from N.H. Fish & Game explains the technique used to compute the scores but doesn't explain the reasoning behind this value.

[13] Adapted from [NHFG04].

Unfragmented blocks are assigned a ranking using a scoring system that considers the total area of the block and the ratio of its area to its perimeter (this latter being a measure of how "skinny" the block is). In both cases, bigger is better.

To account for roadside development a standard corridor of about 750 feet from road center (300 ft. on each side) is marked off and the remainder assigned to the adjacent blocks of land. Each resulting block is then assigned a point value for each of the two dimension (size and area/perimeter ratio) using the criteria shown in the tables below. The final score for each block is the sum of the size and ratio points:

Block score = Size points + Area-perimeter points

Block Points Assigned Based on Size		
Point Value	*Size in Acres*	*Rationale*
1	25–99	▪ 25 ac. = minimum size for breeding pair of whip-poor-wills (Slack and Root 1980).
2	100–499	▪ 100 ac. = minimum habitat patch size for red-shouldered hawk (Robbins et al. 1989). ▪ 80 & 100 males/100 ac. = recorded sample densities of bay-breasted warbler (Morse 1980, Erskine 1992). ▪ 247 ac. = recorded home range of spruce grouse (Ellison 1973), area that 90% of occurrences of veery were recorded in studies in Wisconsin and Illinois (Herkert 1995, Temple 1986), area for a viable population of wood thrush (Robbins et al. 1979).
3	500–999	▪ 560 ac. = 50% probability of occurrence for red shouldered hawk (Robbins et al. 1989). ▪ 500 ac. = approx. max. dispersal area for wood, spotted, or Blanding's turtle based on max. recorded dispersal distance of 2.05 km (Kaufman 1992, Joyal 1996, Compton 1999).
4	1,000–3,999	▪ 1,200 ac. = minimum recorded home range for northern goshawk (USFWS 1998). ▪ 1,280 ac. = male marten home range in Maine (Wynne & Sherburne 1994, Katnik et al. 1994). ▪ 1,320 ac. = max. home range recorded for Cooper's hawk (Craighead and Craighead 1969). ▪ 2,500 ac. = area for 25 territorial Whip-poor-will males (Stewart and Robbins 1958).
5	4,000–9,999	▪ 3,90 –6,144 ac. = range of minimum home ranges recorded for Lynx in four studies (Parker et al. 1993, Koehler and Aubry 1994, Poole 1994, Slough and Mowat 1996). ▪ 9,400 ac. = area required for breeding pair of northern goshawks (Noll-West 1997). ▪ 10,000 ac. = maximum recorded home range for northern goshawks (USFWS 1998). ▪ 6,175 ac. = 25 female spruce grouse territories (home range size: Ellison 1973).
6	10,000–29,999	▪ 10,700 ac. = area needed to support 25 breeding pairs of red-shouldered hawk (based on Crocoll and Parker 1989). ▪ 11,600 ac. = avg. home range of lynx in Maine (Vashon 1999). ▪ 23,616 ac. = avg. home range of male bobcats in Maine – male bobcat home ranges are typically larger than female (Litvaitis 1986) .
7	30,000–59,999	▪ 32,000 ac. = area for 25 marten (based on home range size reported for males in Maine: Wynne and Sherburne 1994, Katnik et al. 1994). ▪ 50,000 ac. = minimum area needed for viable population of Blanding's turtles (Mccollough 1999).
8	60,000+	▪ 66,000 ac. = home range of 25 breeding pairs of Cooper's hawk (based on Craighead and Craighead 1969).

Block Points Assigned Based on Area/Perimeter Ratio		
Point Value	*Ratio*	*Explanation*
1	0–299	Ratios are relative figures based on dividing the area in square feet of an unfragmented patch by the perimeter in feet. Ratios provide a relative measure of the amount of interior habitat available in patches 25+ acres in size. Ratio classes were delineated based on natural breaks in the data.
2	300–599	
3	600–999	
4	1,000–1,399	
5	1,400–1,699	
6	1,700–2,099	
7	2,100–13,105	

5.5. Wetland Types

Emergent

Very wet areas dominated by grass-like water-loving plants, often bordering a pond, lake, or stream. Typical emergent wetland vegetation includes cattails, rushes, sedges, willow, and duckweed (known collectively as "emergent species").

Scrub-Shrub

Very wet areas where woody shrubs (species less than 6 meters tall) account for at least 30% of the vegetation. Scrub-shrub wetlands are a successional stage leading eventually to forested wetlands. Typically found shoreward of emergent wetlands around lakes, streams, and ponds.

Forested

Very wet areas where trees (species at least 6 meters tall) account for at least 30% of the vegetation. Typically found shoreward of emergent wetlands around lakes, streams, and ponds.

5.6. WAP Habitat Types

This section briefly summarizes habitat types relevant to Mason. For a more thorough overview, see *One Granite State, Many Habitat Types* [NHFG12]. For complete details, see "Appendix B, Habitat Profiles" in the NHWAP.

Appalachian Oak-Pine

Warm and dry. At lower elevations than hemlock-hardwood-pine. Restricted mostly to southern N.H. Characterized by oak, hickory, mountain laurel, and sugar maple. Home to a wide range of animal species. An increasingly rare habitat type.

Grassland

Just what you'd expect: grasses and wildflowers with few or no shrubs or trees. Not a naturally occurring habitat in the state (except on a very limited scale) but nevertheless important to several species, including the endangered wood turtle.

Hemlock-Hardwood-Pine

Transitional forest between oak-pine (lower elevations, mostly in southern N.H.) and hardwood-conifer (higher elevations, mostly in northern N.H.). Characterized by white pine, hemlock, beech, and oak. The most common habitat type in the state. Home to several bat species, black bear, and bobcat.

Lowland Spruce-Fir

A mixture of spruce-fir forest and red spruce swamp. Uncommon in N.H. but very important for wildlife. Important deer wintering grounds.

Marsh

Emergent and shrub wetlands (see Sec. 5.5 Wetland Types). An important wildlife food source. Filters water supplies. Home to red-wing blackbird, beaver, and painted turtle.

Peatland

Highly acidic soils and low nutrients make this habitat an important storage zone for carbon. Characterized by sphagnum moss, white cedar, and larch. Home to numerous rare and endangered species.

Pitch Pine

Also known as **Pine Barrens**. Very rare. Sandy soil dominated by pitch pine and scrub oak, with interspersed grassy openings. Maintained by frequent and naturally occurring fires. Favorite areas of white-tailed deer, turkey, and towhee.

Rocky Ridge, Talus Slope

Generally inaccessible, rocky areas characterized by outcrops (rocky ridge) or rock and boulder fields (talus slope). Home to bobcat, timer rattlesnake, and peregrine falcon.

5.7. Soil Drainage Class[14]

Excessively drained

Water is removed very rapidly. The occurrence of internal free water commonly is very rare or very deep. The soils are commonly coarse-textured and have very high hydraulic conductivity (the ease with which water moves through spaces in the soil) or are very shallow.

Somewhat excessively drained

Water is removed from the soil rapidly. Internal free water occurrence commonly is very rare or very deep. The soils are commonly coarse-textured and have high saturated hydraulic conductivity or are very shallow.

Well drained

Water is removed from the soil readily but not rapidly. Internal free water occurrence commonly is deep or very deep. Water is available to plants throughout most of the growing season in humid regions. Wetness does not inhibit growth of roots for significant periods during most growing seasons. The soils are mainly free of the mottling or discoloration commonly related to wetness.

Moderately well drained

Water is removed from the soil somewhat slowly during some periods of the year. Internal free water occurrence commonly is moderately deep and transitory through permanent. The soils are wet for only a short time within the rooting depth during the growing season, but long enough that most mesophytic crops (plants that like it neither too wet nor too dry) are affected.

[14] Adapted from [USDA93].

Somewhat poorly drained

Water is removed slowly so that the soil is wet at a shallow depth for significant periods during the growing season. The occurrence of internal free water commonly is shallow to moderately deep and transitory to permanent. Wetness markedly restricts the growth of mesophytic crops, unless artificial drainage is provided. The soils commonly have one or more of the following characteristics: low or very low saturated hydraulic conductivity, a high water table, additional water from seepage, or nearly continuous rainfall.

Poorly drained

Water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. The occurrence of internal free water is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season so that most mesophytic crops cannot be grown, unless the soil is artificially drained. The soil, however, is not continuously wet directly below plow-depth. Free water at shallow depth is usually present. This water table is commonly the result of low or very low saturated hydraulic conductivity of nearly continuous rainfall, or of a combination of these.

Very poorly drained

Water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. If rainfall is high or nearly continuous, slope gradients may be greater.

6. Appendix II—Data Sources

The following table lists all sources of data used to produce maps and numerical tables derived from map data:

Source	*Where Found*
Massachusetts Geographic Information System (MassGIS)	http://www.mass.gov/mgis/
USGS National Elevation Dataset (NED)	http://ned.usgs.gov/ http://seamless.usgs.gov/
GRANIT at UNH	http://www.granit.unh.edu/
Nashua Regional Planning Commission	http://www.nashuarpc.org
Southwest Regional Planning Commission	By way of Diane Fitzpatrick, Milford Conservation Commission, Milford, N.H.
N.H. Fish & Game Coarse Filter	CD published by N.H. Fish and Game Dept., 2004.
N.H. Fish & Game Wildlife Action Plan	See GRANIT.
N.H. Natural Services Network	See GRANIT.
U.S. Fish & Wildlife Service, National Wetlands Inventory	http://www.fws.gov/wetlands/
U.S.D.A Natural Resources Conservation Service (NRCS)	http://www.nh.nrcs.usda.gov/

7. Appendix III—Wildlife Survey Results

TBS

8. Appendix IV—References

BEN10 *Good Forestry in the Granit State: Recommended Voluntary Forest Management Practices for New Hampshire (Second Edition)*, Karen P. Bennett ed., University of New Hampshire Cooperative Extension, 2010.

CHA99 *Buffers for Wetlands and Surface Waters, a Guidebook for NH Municipalities*, by Chase, Deming, and Latawiec, 1999.

COL00 *Focus Areas for Wildlife Habitat Protection in the Nashua River Watershed*, Jeffrey Collins, Ecological Extension Service of Massachusetts Audubon Society, 2000.

COW79 *Classification of Wetlands and Deepwater Habitats of the United States*, Lewis M. Cowardin *et al*. 1979.

HAN01 *Soil Survey of Hillsborough County, New Hampshire, Western Part*, John F. Handler, U.S. Dept. of Agriculture Soil Conservation Service, 1985.

MAS07 *Mason Master Plan 2007 Update,* Southwest Regional Planning Commission and Town of Mason Master Plan Committee, 2007.

NHFG04 *GIS Procedures For The Coarse Filter Wildlife Habitat Analysis*, N.H. Fish & Game Dept., Sept. 20, 2004.

NHFG12 *One Granite State, Many Habitat Types*, an on-line document available at http://www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/habitat_types.htm.

NRCS *National Soil Survey Handbook, title 430-VI*, U.S. Department of Agriculture, Natural Resources Conservation Service. Available online at http://soils.usda.gov/technical/handbook/.

NRCS02 *New Hampshire Soil Attribute Data Dictionary*, U.S. Department of Agriculture, Natural Resources Conservation Service, 2002. Available on-line at http://www.nh.nrcs.usda.gov/Soil_Data/soil_data_documents/datadict.pdf.

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SWO04 *Handbook for New Hampshire's Municipal Conservation Commissions*, Marjory M. Swope, New Hampshire Association of Conservation Commissions, 2004.

USDA93 *Soil Survey Manual*, Soil Survey Division Staff, Soil Conservation Service, U.S. Department of Agriculture Handbook 18, 1993. Available on-line here: http://soils.usda.gov/technical/manual/.

WAP05 *New Hampshire Wildlife Action Plan*, New Hampshire Fish and Game Department, 2005. Available on-line at http://www.wildlife.state.nh.us/Wildlife/wildlife_plan.htm.