Grater Woods Forest

Stewardship Plan

Merrimack, NH

The MCC and Grater Woods Subcommittee would like to thank

Andy Powell

Chairman of the Merrimack Conservation Commission
for providing the vision and perseverance
that made Grater Woods a reality.

Revision History

Revision	Date	Description	Author
A	April 2011	Initial Document - Draft	Grater Woods Subcommittee
B	Nov 2011	Added references to new official MMC website of town owned lands - Draft	MCC
C	Jan 2012	General Editing of Introduction and Section1 - Stewardship Principles and Goals. Distribution of current plan with revisions - Draft	MCC
D	Mar 2012	Incorporation of Grater Homestead property - Draft	MCC
E	Jan 2013	Distribution of current plan with revisions – Draft Review	MCC
F	Mar 2013	Distribution of current plan with revisions – Draft Review	MCC
G	Mar 2013	Distribution of current plan with revisions – Draft Review	MCC
H	Apr 2013	Proposed Final Draft to be submitted to Town Council for review and approval - Draft	MCC
01	27 June 2013	Initial Publication of Approved Plan	MCC

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Introduction

According to NH RSA 79-A, Current Use Taxation:

"It is hereby declared to be in the public interest to encourage the preservation of open space, thus providing a healthful and attractive outdoor environment for work and recreation of the state's citizens, maintaining the character of the state's landscape, and conserving the land, water, forest, agricultural and wildlife resources."

The Grater Woods Forest was originally the result of the unification of several abutting land parcels owned by the Town of Merrimack and actively managed by the Merrimack Conservation Commission (*MCC*). An additional parcel, owned by the Merrimack School District (*MSD*), includes the Merrimack Middle School (MMS) and a 34-acre conservation easement. The current property consists of the tax deeded parcels listed in Appendix J.

The Grater Woods Forest lies south of Baboosic Lake and extends from the Amherst town line on the west to Old Blood Road on the east. Residential developments abut it on the north and east. To the west is Amherst conservation land and several private undeveloped parcels. The private land to the south remains forested but has the potential to be developed in the future. Currently the Grater Woods Forest encompasses approximately 500 contiguous acres of open space. Approximately half of the land lies within the Baboosic Lake watershed; the remainder drains easterly through a series of beaver ponds to a small-unnamed tributary of Baboosic Brook.

Grater Woods encompasses a wide variety of *jurisdictional wetland* and upland wildlife habitats. Significant features include several beaver ponds, several scattered wetland complexes, and numerous *vernal pools*. The steep upland slopes are covered with a mature hemlock forest; with a mix of hard and soft wood trees covering the rest of the land. Grater Woods is a contiguous forest, meaning it is not divided by roads. Contiguous Forests of this size are considered significant due to the unfragmented richness and variety of the wildlife habitats found on it. Wildlife living or using the Grater Woods Forest includes the larger mammals (bear, deer and moose), the smaller mammals (otter, porcupine, raccoon, fisher, coyote and beaver) plus a variety of turtles, salamanders, frogs, toads, bats and mice. The bird population includes many small birds along with heron, ducks, owls and hawks. Fish are found in the larger beaver ponds and insects abound throughout.

Discussions between the *MCC* and *MSD* led to an agreement, recorded on the *MSD* registered property deed, that the *MCC* would actively manage the conservation easement in conjunction with the town-owned Grater Woods. .

The Grater Woods Stewardship Plan contains the guiding principles we follow and establishes goals for the stewardship of Grater Woods. The Stewardship plan, as presented herein, is the guideline to support the active management of this important natural environment. As is true with nature, nothing remains the same over time, therefore, it is expected that the detailed plans will always have to be adjusted to accommodate new

knowledge or occurrences; but the goals are intended to remain as the guiding stewardship principles for those who step up and volunteer to help support the Stewardship of the Grater Woods Forest.

Definitions and Acronyms

The following acronyms and terms and their definitions are provided for use in this document only.

1. ADA - Americans with Disabilities Act
2. Athletic complex - A developed area consisting of one or more athletic fields and support facilities.
3. ATV – (All-Terrain Vehicle) An ATV is defined as a wheeled, motorized recreational vehicle, 50 inches or less in width, weighing less than 1000 pounds. This definition is meant to include, but is not limited to 3 and 4 wheeled vehicles.
4. Biodiversity - The diversity of living things at multiple scales, including genetic diversity within a population, species diversity, and the diversity of habitats across a landscape, interconnecting to create complex ecosystems.
5. BMPs (Best Management Practices) A set of recommendations developed by the State of New Hampshire for the most effective, practical means of preventing or reducing the likelihood of potential problems from a variety of land management practices.
6. Conservation Easement – Refer to NH RSA 477:45-47
7. Current Use Value - The assessed valuation per acre of open space land based upon the income-producing capability of the land in its current use solely for growing forest or agricultural crops, and not its real estate market value.
8. DBH – (Diameter at breast height) The standard forestry method of expressing the diameter of the trunk or bole of a standing tree
9. DES – (Department of Environmental Services) State agency responsible for protecting and restoring the environment and public health in New Hampshire
10. Ecosystem - A biotic community, meaning all of the populations living in a designated area and functioning together with the nonliving environment.
11. EPA – (Environmental Protection Agency) Federal agency responsible for protecting human health and the environment.
12. Epicormic Bud – A dormant bud or shoot which lies underneath the bark of a trunk or branch of a plant
13. FGW – (Friends of Grater Woods) A volunteer organizations initially responsible for organizing events and volunteers within Grater Woods
14. Forest Land - Any land growing trees as determined and classified by criteria developed by the state forester and adopted by the local board.
15. Forestry Stand - Any land growing trees of a specific species as determined and classified by criteria developed by the state forester and adopted by the local board.

16. Glacial Erratic - A piece of rock carried by glacial iceglacial ice some distance from the rock outcrop from which it came that differs from the size and type of rock native to the area in which it rests.
17. GWOEC – Grater Woods Outdoor Educational Center
18. Habitat - An identifiable region in which a particular kind of organism lives.
19. Igneous rock - A rock formed by the crystallization of molten magma.
20. Invasive Species - an alien species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
21. Jurisdictional Wetlands – A documented and mapped area that is 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
22. LUCT – (Land Use Change Tax) A tax based on the assessed "Current Use Value" of land when it is removed from Current Use
23. MBF – (1000 Board Feet) A typical unit of trade for dimension lumber and sawtimber
24. MCC – (Merrimack Conservation Commission) A volunteer group of Merrimack residents established to assist in protecting the natural resources of the municipality.
25. Metamorphic rock - A rock formed by the alteration of pre-existing rock deep within the earth (but still in the solid state) by heat, pressure, and/or chemically active fluids.
26. MPWD (PWD) - Merrimack Public Works Department
27. MSD – Merrimack School District
28. Natural Community – A recurring assemblage of plants and/or animals found in particular physical set of environmental conditions that support certain species adapted to those conditions.
29. NH Right Riders – Locally organized and recognized OHRV club.
30. OHRV – (Off Highway Recreational Vehicle) Any mechanically propelled vehicle used for pleasure or recreational purposes running on rubber tires, tracks, or cushion of air and dependent on the ground or surface for travel, or other unimproved terrain whether covered by ice or snow or not, where the operator sits in or on the vehicle. OHRVs shall not include snowmobiles as defined in RSA 215-C
31. OPDMD – (Other Power-Driven Mobility Devices) Any mobility device powered by batteries, fuel, or other engines, whether or not designed primarily for use by individuals with mobility disabilities, that is used by individuals with mobility disabilities for the purpose of locomotion,
32. Open Space Land - Areas that is maintained in an undeveloped state, and may include *trails* and sustainable forestry and habitat management activities.

33. ORV – (Off Road Vehicle) Any motor vehicle, as defined by RSA 259:60, or any OHRV except Snowmobiles, Trail Bikes, ATVs and those vehicles expressly permitted by the MCC.
34. Poled Ford - A temporary wetland crossing built out of small diameter trees. The purpose of a poled ford is to keep equipment out of the wetland and avoid disturbance to wetland soils.
35. Priority Habitat – Habitat that supports rare, threatened, or endangered species, or species of concern.
36. Riparian Buffer / Zone – Strips of grass, forest duff, shrubs, and/or trees along the banks of rivers, streams, floodplains, and wetland areas that provide a transition zone between water and human land use
37. RSA – (New Hampshire Revised Statutes Annotated) forms the collected and ordered laws of the state, subordinate to the New Hampshire State Constitution.
38. SAU – Merrimack School Administration Unit
39. Sawtimber - A log or tree that is large enough to be sawed into dimensional lumber. Typically a minimum of 10 to 12 inches in diameter and 8 feet in length.
40. Schist - The foliated texture of mica crystals giving metamorphic rock a scaly or layered appearance. Schists are named according to their mineral constituents.
41. Sill - A tabular igneous body that has intruded parallel to the layering of pre-existing rock.
42. Silviculture – The plan for controlling the establishment, composition, constitution and growth of forests and the resources within it.
43. Snowmobile - Any vehicle propelled by mechanical power that is designed to travel over ice or snow supported in part by skis, tracks, or cleats. Only vehicles that are no more than 54 inches in width and no more than 1200 pounds in weight shall be considered snowmobiles. "Snowmobiles" shall not include OHRVs as defined in RSA 215-A.
44. Stewardship Team - The defined members of the MCC and associated MCC Sub-Committee responsible for the designated Open Space and/or Forest Land.
45. Stone Ford -A wetland crossing constructed out of crushed stones and/or large cobble that allow for continuous water flow, but keep equipment from sinking into wetlands.
46. Sustainable Forest – Management of the forest resources for use in perpetuity.
47. Swale - A depression in wet, marshy ground regularly used for diverting water.
48. Trail - A designated path, track, route or other thoroughfare used for travel
49. Trail Bike - Any motor-driven wheeled vehicle on which there is a saddle or seat for the operator or passenger or both and which is designed or adapted for travel over surfaces other than maintained roads, whether covered by ice or snow or not.
50. Transect - a sample strip of land used to monitor plant distribution, animal populations, etc., within a given area
51. Uplands - Areas of land at a higher elevation than the abutting area.

52. Vernal Pool - A seasonal pool, usually occurring as a result of spring rains, snow melts or an elevated water-table, contained in a basin or depression lacking a permanent above ground outlet.
53. WAP – (Wildlife Action Plan) A federally mandated and funded document created by The NH Fish & Game Department to provide New Hampshire decision-makers with tools for restoring and maintaining the critical habitats and populations of the state's species of conservation and management concern.
54. Web - Relations in a community regarding feeding in which an organism obtains nutrients from another organism and in turn provides nutrients to yet another
55. Woods Road – A thoroughfare traversing a wooded area or forest allowing for the passage of emergency and/or designated maintenance equipment.

Section 1 Stewardship Principles and Goals

The *MCC*, the designated management organization for Grater Woods, shall protect and manage the Grater Woods wildlife habitats, wetland resources, and the forest for the *biodiversity* it offers. The forest stewardship principles are supportive of the applicable initiatives in the NH Wild Life Action Plan, the Merrimack Conservation Plan and the applicable Best Management Practices (*BMP*s) and other professionally prepared documents and publications. In concert with our town expectations and resources, expert consultants shall be used for guidance and evaluation.

When the Town of Merrimack Master Plan was updated in 2002, the Natural Resources chapter specifically designated the area now known as Grater Woods as a "high priority area" for action. The Master Plan included the statement that

> "…a land acquisition strategy should be pursued that places the highest priority on the acquisition of lands that can, when managed for conservation purposes, accomplish the widest range of objectives."

The *MCC* has worked to follow the Master Plan acquisition strategy. In 2002, the year the master plan was revised, the town owned 93 acres in the designated high priority area. In the following eight years the *MCC* has acquired several additional parcels and expanded Grater Woods to approximately 500 acres of contiguous open space.

It is generally recognized by wildlife *habitat* specialists that five hundred acre blocks of unfragmented, contiguous forestland remaining undeveloped with few or no roads, are significant environments for wildlife. Unfragmented blocks of this size are able to sustain multiple natural habitats that support a diverse wildlife population. Large forested blocks of land are especially important to the wide-ranging animal species, such as deer, moose, bear, etc., that cannot survive in small, less diverse habitats. In Merrimack, and all of southeastern New Hampshire, there is a high level of development and any unfragmented block of 500-acres of forested land is of significant importance and should be protected for its wildlife, aesthetic and recreational values.

It is therefore a guiding Stewardship principle that the Grater Woods Forest be managed for the widest range of objectives. This will mean preserving and perhaps expanding the unfragmented forestland of The Grater Woods Forest.

Once the Grater Woods Stewardship plan is accepted, the *MCC* will create a well-educated and trained sub-committee responsible for the oversight and management of the Grater Woods Forest.

The following 5 un-prioritized Stewardship Principles and Goals are intended to provide the guiding structure for the stewardship of The Grater Woods Forest.

1. Develop and Maintain a Healthy Sustainable Forest

Forests are one of the most important natural resources for both our state and our town. They provide an aesthetic "rural" value to our town, natural sustainable habitats, areas for recreation and are a renewable resource for forest products. The Grater Woods forest provides critical *habitat* for a wide diversity of wildlife and *natural communities*. Forested areas in Merrimack continue to decline as residential development continues throughout our town. With few exceptions, the remaining forest blocs are fragmented and not protected or managed by professionals. The town shall maintain the forested state of Grater Woods as it provides wildlife *habitat*, plays a vital role in the quality and protection of our water resources, maintains a local resource for timber and other forest products, a potential source of funds for stewardship projects and provides the opportunity for open space recreation.

The practice of *sustainable forest* management has received increased attention in recent years. Forest management professionals recognize the inter-relationship of wood, water and wildlife resources. Today's well-managed forestry harvests allow the forest to remain healthy while providing the production of income, wildlife *habitat* improvement and the creation of infrastructure.

Strategic Stewardship Principles for developing and maintaining the forest include:

- Develop a *sustainable forest*ry program as a tool for forest health following the American Tree Farm program. This program will be reviewed on a scheduled basis as determined by the *MCC*.
- Use Grater Woods and the American Tree Farm program as an example of proper open space sustainable stewardship by keeping it "in the public eye" as an educational tool.
- Utilize forestry revenues for building infrastructure, *trails*, *habitat*, correcting erosion, etc.
- Forestry Classes and Projects – Utilization of local resources for projects such as logs to lumber, Walk About workshops, *trail* building, *habitat* maintenance and supporting other non-*MCC* projects.
- Utilize the Best Management Practices (*BMP*s), the NH Wildlife Action Plan (*WAP*), Merrimack *Biodiversity* Plan and other resources to coordinate the Grater Woods forestry goals and related stewardship activities.
- Use a professional forester and other related experts for guidance on forestry, *trails* and *habitat* development.
- Continue to educate the Stewardship team and the public in the many issues involved in meeting these goals.

2. Manage Wildlife Habitats

It is truly an opportunity and a challenge to manage 500-acres of wildlife *habitat* and its related natural communities. As noted above, a primary function of the Stewardship plan is to protect and enhance the wildlife habitats for all users. The importance of 500 acre blocks of unfragmented forestland, undeveloped with few or no roads, cannot be overlooked. Few towns in this part of the state are able to assemble tracts of unfragmented protected *open space land*, with the ability to sustain multiple habitats and support the diverse wildlife population found in Grater Woods.

The NH Wildlife Action Plan has indicated many “areas of interest” in our town and specifically in Grater Woods. A survey of natural resources was used as a tool in the development of a Merrimack Conservation Plan and has added more detailed information on the wildlife in Grater Woods. Neighbors abutting the property and other users continue to volunteer information on their wildlife observations. As we, the *MCC*, continue to learn more about the Grater Woods property, we must continue to make the efforts necessary to sustain the variety of habitats supporting the existence of deer, moose, bear, blue heron, bared and horned owls, red tailed and cooper hawks, beaver and fisher plus an abundance of amphibians, turtles and birds.

Strategic Stewardship Principles for developing and maintaining wildlife *habitat* include:

- Utilize appropriate NH Fish and Game and other grant programs for *habitat* planning and development.
- Develop and maintain an inventory record of wildlife sightings in order to become aware of trends over time.
- Use forestry projects as a tool to provide active stewardship of wildlife habitats.
- Consult with UNH Extension Service resources, NH Audubon members and other wildlife specialists.
- Develop continuing educational programs for students and adults by creating awareness and interest in Grater Woods through multiple programs.

3. Manage Wetland Resources – Large and Small

The Grater Woods contains a wide array of important wetlands ranging from large beaver ponds to swamps along with an abundance of small isolated *vernal pools*. Throughout the entire Grater Woods property, there are many areas considered "*jurisdictional wetlands*". The numerous and variety of wetlands provide an excellent *habitat* for many amphibians, reptiles, birds and fish species. Water is essential for all of the wildlife found in the forest and the health of the wetlands is a critical element in this Stewardship Plan.

Many of the amphibians, especially frogs, salamanders and turtles, live their entire life within 500 feet of the *riparian zones*. Others, the Blanding Turtle for example, is a traveler and is found moving through the *uplands* between different ponds. The beaver are often the creators and the maintainers of the larger water bodies. Human activity in and around the wetland habitats may be detrimental to the wildlife especially during the breeding season.

Strategic Stewardship Principles for protecting the wetland resources include:

- Locate, catalog, map and deliniate the wetland and water resources to include ponds, *vernal pools*, swamps and streams.
- Determine the present state of each wetland resource and evaluate the future changes to be expected. Include an evaluation of the wildlife using the wetland.
- Determine protective buffer zones around key *riparian areas* and use the buffer areas in planning Grater Woods projects.
- Educating all users to the laws and importance of the sensitive nature of the wetlands and *riparian areas*.

4. Provide Compatible Recreational Opportunities

Many people have used the Grater Woods land over the past years for a variety of recreational activities such as hunting, geo-caching, horseback riding, fishing, hiking, etc. Currently, the Grater Woods Forest is also open to use by *OHRV* motorized vehicles and many non-motorized uses. Exceptions to this statement do exist and are listed in the deeds and/or easement restrictions for specific parcels.

In order to benefit from lessons learned, the *trail* plan shall consider the current users and attempt to balance their traditional uses with the other goals as stated previously. Action on *trails* currently in use and development of any new *trails* must be based upon the Stewardship Team's evaluation of the *trails* impact and suitability. The lack of formal *trail* planning and maintenance has resulted in extensive repair efforts required to correct many existing *trails*. Many of the existing *trails* simply followed old logging roads. As a result, there are numerous *trails* traversing deep and/or muddy areas. These *trails* are subject to erosion and were developed without adhesion to the Best Management Practices for *trail* construction. There have been no officially coordinated long-term attempts at maintaining the Grater Woods *trail* systems.

The *MCC* has developed a unified *trails* system and over the past few years, utilizing various forestry projects and volunteer work-days to correct some of the erosion and location issues within 140 acres of the forest. In many instances, the *MCC* has upgraded the *trails* within the forestry area to provide four-season use while minimizing environmental impacts. The *MCC* will continue to upgrade *trails* outside the forestry areas as time, funds and volunteers are available. *Trails* open to all users will require re-grading periodically while foot traffic *trails* may require relocation or renovations. Best Management Practices and the expertise available from the NH Trails Bureau will be utilized to locate, create and repair the *trails*. The upgraded woods-roads are designed to require a minimum of maintenance based on the frequency of their intended use. Users of the *trail* system, including individuals and clubs, are being solicited to help in the construction and on-going maintenance of the Grater Woods *Trail* System.

Strategic Stewardship Principles for developing a *trail* system include:

- Compatibility with wildlife and forestry goals.
- Establishing a marking system that is user-friendly and suitable for all levels of users.
- Providing recreational opportunities for many types of users.
- Access from abutting private parcels will be reviewed and use policies established.(Refer to RSA 472:6 Removing or Altering Boundary Markers)
- Participation in construction and maintenance will be sought from the Stewardship Team and volunteers.
- Various forms of funding sources will be sought to assist in repairing existing and developing new *trails*.

- Develop a plan for additional *trails*, such as the Proposed Environmental Education *Trail*, *trails* into areas not currently accessible and *trails* to replace current ones that do not meet the *BMP*s.
- Remain cognizant of use restrictions on neighboring parcels such as the easement restrictions recorded on the *MSD* deed, prohibiting the use of motorized vehicles and hunting.
- The *MCC* will exercise it's authority to temporarily close any *trails* when damage would occur that is contrary to the goals of this Stewardship Plan.

5. Establish an Educational Program for All Ages

The Grater Woods Forest is adjacent to the Merrimack Middle School, which makes this an excellent area for educational programs. In a further effort to support the importance of environmental based educational opportunities, the Merrimack Middle School, *MCC* and local volunteers built an outdoor educational center for both Merrimack students and adults with seating for 75 people overlooking an ever-changing Beaver Meadow *habitat*. The Grater Woods Outdoor Educational Center is located approximately 50' feet to the North of the Merrimack Middle School, making it an easily accessible alternative to a traditional classroom.

The Middle School students are learning about and maintaining *transects* to collect information on wildlife while learning about the outdoors. Future plans include development of an environmental education *trail* to help all citizens to understand the importance of protecting our environment.

Strategic Stewardship Principles for establishing an educational program include:

- Establish and maintain a close working relationship with the schools.
- The *MCC* should work to create educational programs for adults and students.
- Assist the teachers by providing teaching aides, assisting in the classroom, leading tours in the forest and running workshops.
- Work with School administration and teachers to develop curriculum based educational opportunities consistent with the state's environmental educational goals and the "New Hampshire Children in Nature Initiatives".
- Provide funds to support selected students in summer educational programs involving wildlife activities, environmental issues and related topics.
- Develop a plan to expand the Grater Woods Outdoor Educational Center (GWOEC) in order to create a facility that could be used in all seasons by students and adults.
- Develop a plan to provide further environmental based educational opportunities.

Section 2 Sustainable Forestry and Forest Stands

The *MCC* has acted on behalf of the Town to develop the many parcels of land that are now known as The Grater Woods Forest. To properly support the Grater Woods Forest, a forest-planning document must take more than just the forest trees into consideration. The forest contains critical habitats for many wildlife species; it processes much of our water resources and contains a mixture of soils. It is a complicated system that requires professional guidance and knowledge of current best practices.

As individual parcels were purchased and/or donated, the *MCC* hired a forester to inventory and evaluate the *forest stands* and to prepare an initial management plan on a stand-by-stand basis. The resulting document also included observations of wildlife, forest health issues, wetlands and other natural resources. The forester briefly outlined a forestry plan (a recommended course of action), for consideration.

Forest stands are defined in *Good Forestry in the Granite State* as "a group of trees reasonably similar in age, structure and species composition and growing on a site of sufficiently similar quality to be distinguishable from adjacent areas." For example, a stand of white pines are differentiated from a stand of red and white oak trees. A stand of young maples, ranging from 4 to 9 inches in diameter, is differentiated from a stand of spruce over-story with young maples growing underneath.

All forestry operations should be conducted following the current *sustainable forestry BMP* and will be conducted with the assistance of a licensed NH Forester. The latest edition of *Good Forestry in the Granite State* should be consulted as a guidance document. The *NH Wildlife Action Plan* should be a primary source of information on natural communities, wildlife species and their habitats.

Funds generated from *sustainable forestry* harvests and stewardship projects, if any, should be deposited to the *MCC* Special Conservation Fund. The construction of forest infrastructure should be the primary use of funds received from timber harvests. This is an investment that will pay off during later harvests by lowering the costs to the logger and thereby increasing net revenues. Through the use of an active Wildlife/Timber Management Schedule and *LUCT* funding, the *MCC* has created a self-sustaining forest able to support the upkeep and infrastructure without seeking additional funds.

The maps, shown as Figure 1 and 2 identify the Grater Woods *forest stands*. The letters used on the maps vary from the original forest stand maps produced by the foresters. The descriptions of stands A through N are derived from both information supplied in the 2001 and 2007 town forester plans and supplemental information supplied by members of the MCC and the prior Grater Woods Subcommittee. The descriptions of stands O through U come directly from the Grater Woods Homestead Management Plan completed in 2011.

Several stands may contain the same tree mix but they are assigned a different letter due to their separation from each other, requiring them to be considered individually. It is important to recognize that the *forest stands* are not to be considered individually but as a part of the whole forest system that contains approximately 500 acres of interrelated lands. Over time the stand evaluations can change, as the forest is a living system and subject to changes. Storms, fires, insect invasions and other natural occurrences can alter the forest so re-evaluation should be done on an ongoing basis and certainly before any forestry project is finalized. Actions on abutting lands must also be considered.

The Grater Woods Forest will be subject to an ongoing Wildlife/Timber Management schedule based on the needs of the forest and the initial harvest efforts of the various areas. After each timber harvest, the affected forest area will be assessed by the *MCC* or their designee for necessary maintenance.

Forests are essential for preventing erosion of existing soil and maintaining clean water. For the most part, there is very little erosion taking place within the woodlot itself because of the undisturbed duff layer of organic material sitting on top of mineral soil. Grater Road, however, has a number of incidences of point-source sedimentation into brooks and the beaver pond because of poorly maintained water crossings and failed culverts.

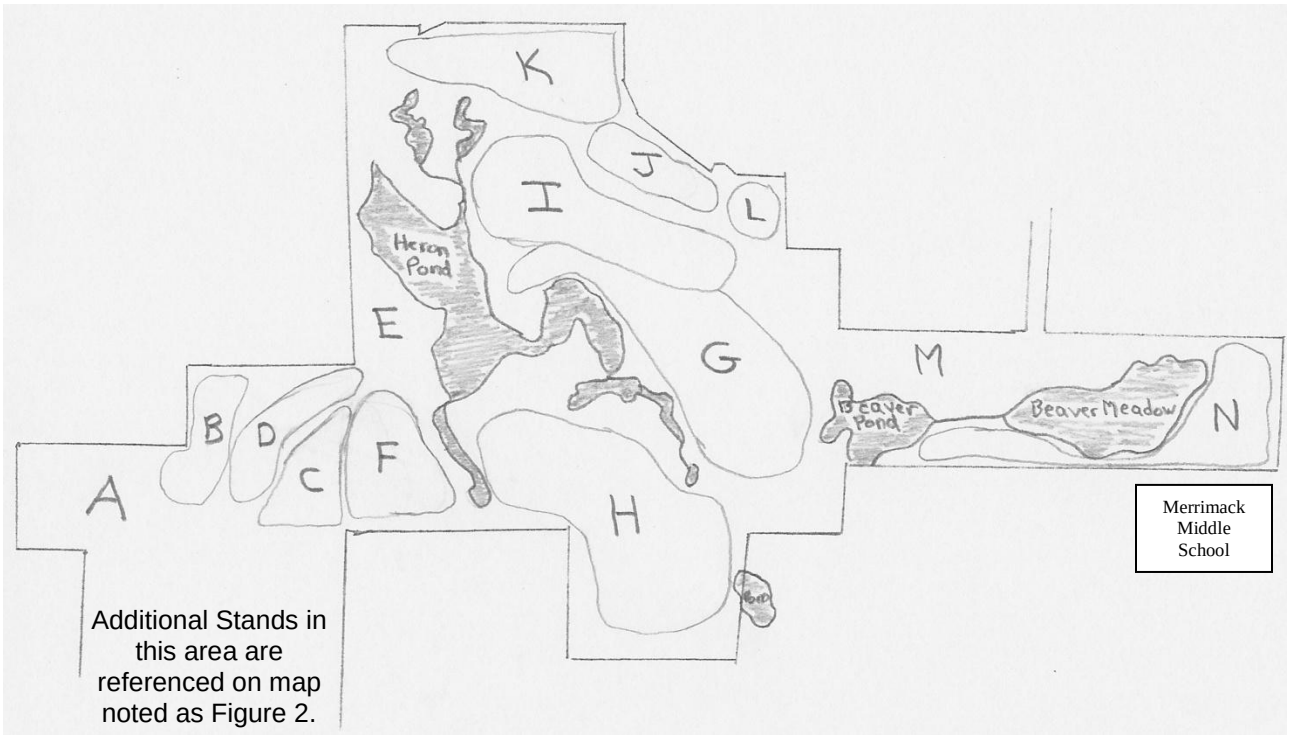


Figure 1 - Forest Stands

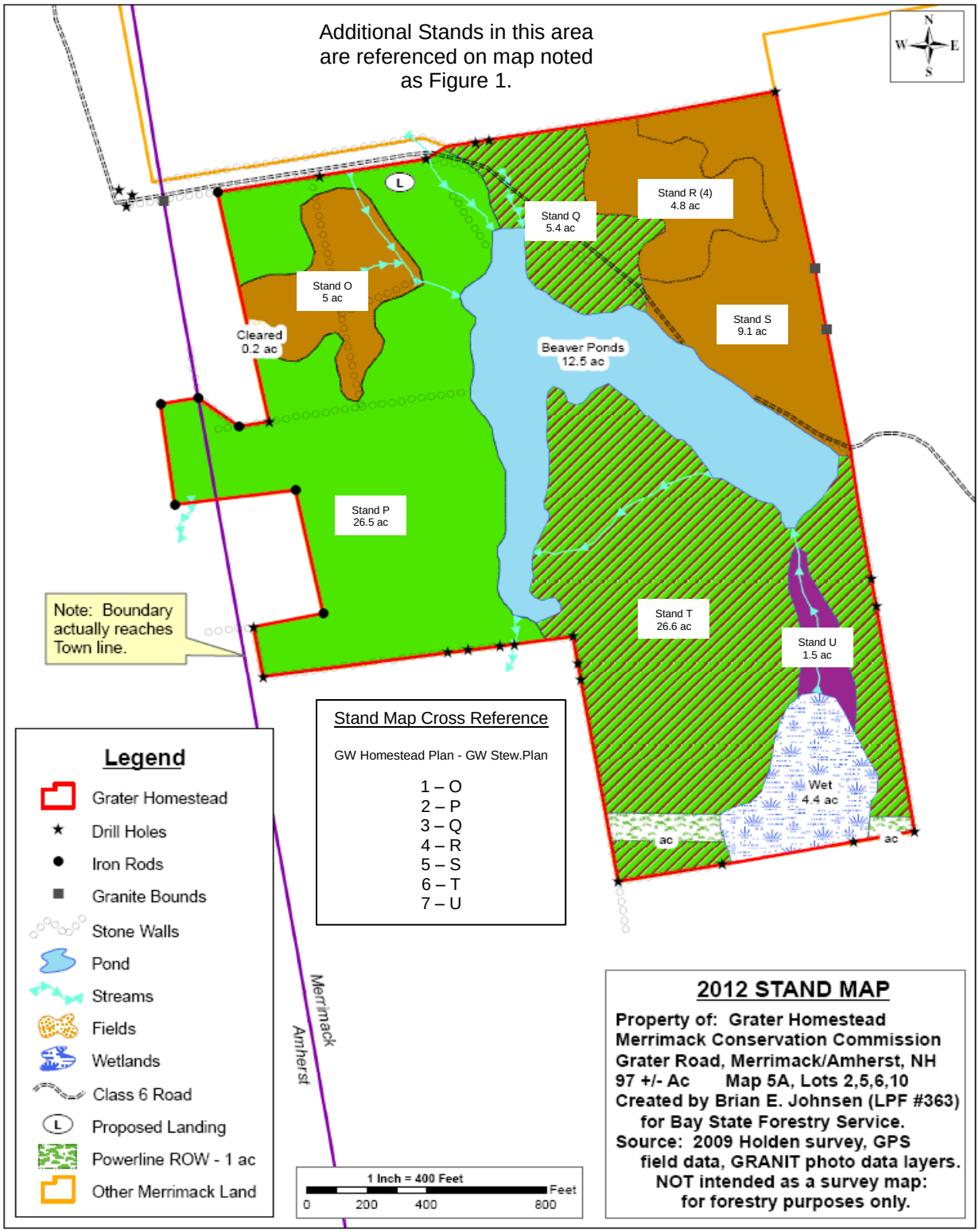


Figure 2 - Forest Stands

Stand A (2001)
White Pine overstory with mixed hardwood and pine understory

Observation: Scattered large mature but non-marketable white pines remain as the result of an apparent "high grade" harvest in the 1970's. (High grading a forest means the logger cut only quality trees with value while leaving poor trees, small trees and essentially removing most value from the forest for many years to follow.) The understory (the smaller trees living under the larger ones) consists of multiple young 6 inch to 12 inch diameter pine and oak saplings, 10 to 30 feet tall, with the potential to change the nature of the forest to hardwoods over the next 30-40 years.

Several *vernal pools* and wetlands were observed but not mapped at this time. Access is from the existing Class VI South Grater Road. Access from Grater Road will require improvements in order to permit logging truck access and a landing area will need to be established for processing the logs. The area is generally flat with well-drained soils with no steep slopes in excess of 15%. The stand can be improved for long-term production as it matures. Openings should be created to create additional wildlife *habitat*. The Salamander and Millipede *trails* are located in this area.

Wildlife: A wide variety of wildlife activity is evident.

Forestry Plan: Portions of South Grater Road are underwater or greatly eroded and action should be taken to improve the conditions in conjunction with any forestry project. The *MCC* should consider establishing a parking area in cooperation with the Amherst Conservation Commission. Also, the portion of Grater Road located within the town lands should be considered for *trails* designation and the possible installation of gates to control unwanted traffic access.

Conduct a biomass or conventional harvest to selectively remove the multi-stemmed, low quality white pine overstory. This will release the younger hardwood and pine understory saplings. Create several wildlife openings. Working with the Amherst Conservation Commission could potentially result in improved access through a mutual harvesting project. *Vernal pools* will have to be mapped and protected with buffers. There is a stream crossing that will require a wetlands permit.

Stand B (2001)
Red Maple

Observation: This is a small stand of trees 30-35 years old located in a poorly drained area. The water table is very high and a stream flows through the stand. Due to the amount of water present and the fairly steep slopes it is best to leave this stand "as is" for use by wildlife.

Wildlife: Numerous signs of deer were observed in the area along with *vernal pools*.

Forestry Plan: Leave the area undisturbed due to the steep slopes and water concerns. Monitor the *trails* for erosion and relocate as necessary.

Stand C (2001)
White Pine and Hemlock

Observation: This stand is typical of ridge top conditions with the trees shallow rooted over exposed bedrock throughout most of the stand. The stand has apparently not been harvested since the 1970's as it contains trees 25-30 years old. Access to the stand would be from the old logging road. The terrain is generally steep, very steep in some locations, so equipment limitations exist. The eastern boundary line runs along a steep slope and abuts a hardwood stand as it drops down into a wetland. A mountain bike *trail* runs through portions of the stand. There is evidence of a stone dam in the wetlands. A "party area" is evident with a fire pit and debris

Wildlife: A large *vernal pool* exists near the top of the hill and it should be mapped and monitored. There is evidence of deer, porcupine, and small mammals and birds throughout. A hardwood stand exists over the boundary to the south and serves as an excellent mast producer.

Forestry Plan: Conduct a light biomass or conventional saw timber harvest to remove some of the mature white pine and hemlock to enhance the growth of the sapling understory. Locate the logging road to create a *trail* through the stand.

Stand D (2001)
Scattered old pine with young hardwood sapling understory

Observation: This is another area that was heavily cut in the 1970-1980 period with a few poor large trees remaining but a nice growth of saplings in the understory. The old logging road/*trail* requires repairs to prevent further erosion especially on the steep hill, as it is not practical to relocate it due to steep slopes on both sides.

Wildlife:

Forestry Planning: The long-term goal should center on wildlife *habitat* enhancement. The stand could be enhanced with the addition of wildlife openings of 1/2 to 1 acre size using conventional methods or as a biomass harvest.

Stand E (2001)
Scattered Hemlock with young hardwood sapling understory

Observation: This stand is located between the base of the steep hill, the rear lot lines of several houses on Beebe Lane and runs along the edge of a large beaver pond. It was apparently cut very heavily in the 1970-80 period. The pond drains to the north through

wetlands into Baboosic Lake about ½ mile away. The original logging road is located on private land but access could be developed from the end of Beebe Lane.

Wildlife: The beaver pond is now all within Grater Woods. It includes a heron rookery and wood duck boxes placed by the *MCC*. The food stock for the beaver is limited on this side of the pond.

Wildlife *trails* are evident with deer, moose, otter and snowshoe rabbit sign. The pond area is the center of wildlife activity for many species and is a valuable asset to protect and manage properly. The heron rookery trees throughout the pond are falling and the nesting sites are on the decrease. Exploration of a means to maintain the *habitat* should be explored.

Forestry Plan: This area was forested in 2008. A light-duty emergency access road was constructed in order to improve access into the internal sections of the forest along a *woods road* (Gateway *Trail*) from the eastern portion of Grater Woods located close to the Middle School parcel. An additional light saw timber harvest to create patch cut openings for wildlife browse should be conducted, and the hemlock from the pond edges should be cut in order to provide younger hardwood for the beaver. The stand will be improved by thinning the saplings by trained volunteers under supervision of a forester. Erosion control is required in several areas. Brushing back along the road would enhance usage and enhance deer browse. Work should be avoided during the blue heron breeding season.

Any forestry activity would be easier with access from western side of the property and efforts should be made to obtain it on a permanent basis. Since access to the western side has not been obtained across the private land, an alternative access point to connect to the new road should be constructed for use by maintenance and emergency vehicles.

Stand F (2001)
Scattered Hemlock overstory with mixed hard wood saplings

Observation: This stand is on very steep slope extending from Stand C down into a small beaver pond and extended wetland. A dense portion of the hemlock provides deer shelter and mast is abundant.

Wildlife: Deer signs are very evident under the hemlock. As of 2008 the beaver pond did not appear to be active and it has “blown out” at this time. The wetlands still exist and are an important wildlife area.

Forestry Plan: Leave the forest on the steep slopes to mature naturally. In 2008 a 1-2 acre wildlife opening was created between the steep slope and the beaver pond. Several mature mast trees remain as a source of food for deer, turkey, moose, bear and other smaller creatures. The opening should be maintained by periodic cutting of any sprouts

not pruned by the grazing deer herd. A second open area was also created to the east as a log landing in the 2008 forestry project. Numerous wildlife shrubs were planted along the *woods road* and in the landing area to include winterberry, dogwood and buttonbush. Several native wild flowers were also planted. Future plantings should be considered for erosion control, food supply and enjoyment by those walking on the Gateway *Trail*.

Stand G (2001)
Hemlock and mixed hardwood scattered overstory / Hardwood and White Pine sapling understory

Observation: This is a fairly large area that was heavily cut in the 1970-1980 period with a few poor-quality large trees remaining but a nice growth of saplings in the understory. The terrain is gently rolling with Canton stony fine sandy loam being dominant. The open area is the hub for *trails* converging from all directions - from the school, from the north towards Conservation Drive, Red Maple Swamp and Beebe Lane, and from the west.

Wildlife: The forest abuts an active beaver pond with new dams and lodges. The opening was planted with clover and other grasses along with native wildlife shrubs along the edges as future food resources for the wildlife. Future plantings of fruit trees along the edges or in the immediate area should be considered. The open space must be maintained as a grassy area by mowing periodically. The small pond immediately to the west and several *vernal pools* are important habitats to be maintained by buffers. Cub Scouts placed several bat houses in the trees. Additional nesting boxes for kestrels would be appropriate. Barred owls and red tail hawks have been seen in the area The long-term goal should center on wildlife *habitat* enhancement, as it is adjacent to a winter deer yard area.

Forestry Plan: The stand was enhanced in 2007 by a selected fairly heavy thinning of the overstory. Mast trees (oak) were left to produce food while red maple was cut to provide sprouts for food and low under growth for small animal *habitat*. The creation of a 2-acre wildlife opening (the log landing) was completed. The extensive thinning had a great visual impact on the area but the purpose was to create an excellent growth of hardwood saplings in the vicinity of the deer herd wintering area so they would save energy when seeking food during the hard winter months. The deer have browsed the new saplings extensively.

Stand H (2001)
Heavy mature Hemlock overstory with hardwood saplings

Observation: This is a mature hemlock stand located on a steep slope. This area was apparently not cut in the 1970-1980 period when many of the other stands were logged extensively. Along the base of the slope is a rolling area that was cut in the 1970-1980 period. Hardwood saplings are present with less hemlock over-story. The area extends all the way to the western and northern beaver ponds and wetlands and

along both sides of Gateway *Trail*. Some white pine is evident. The old logging road runs through the gentle area and is used as the major *trail*. NOTE: This area should have very limited recreational activity and must be "off limits" to all activity in the winter months.

Wildlife: This is an important winter deer yarding area where the deer seek protection from the weather and predators. The State recognizes it as one of the areas of concern since any disturbance during the winter months may have a serious effect upon the herd. During the winter of 2007 there was dramatic evidence of the use of the hemlock grove area for bedding and security. Bedding spots were seen throughout and deer *trails* and "highways" went out in several directions, often several feet deep in the snow cover. The private parcel to the south has browse and the deer also headed down towards the ponds and across to the Marty Drive and Beebe lane areas when food was needed. Moose also use the area as several of the maples were marked by their browsing. *Vernal pools* are present.

Forestry Plan: The mature hemlock stand is located on the steep slope and on the abutting knolls. The area is critical *habitat* supporting the Grater Woods deer herd. The stand should remain mainly undisturbed by forestry or seasonal recreation. It is anticipated that the land to the south will experience development in the future and this will create a greater reliance on food supplies within Grater Woods for the deer herd to remain healthy. In order to increase the food browse, the MCC cut openings in the area at the base of the slope and in Stands F and G during 2007 and 2008. The MCC advised the School Administration to do the same in their forest abutting this stand to the east. The *MSD*, in their 2007 logging effort, followed this advice. Future actions include brushing back along the road to enhance deer browse. See the supporting and interrelated Forestry Plans for Stands F and G also.

Stand I (2007)
Heavily cut White Pine saw timber with hardwood poles

Observation: The stand is on the northwestern portion of Grater Woods. It abuts beaver ponds to the west and south with wetlands containing the stream flowage from Red Maple Swamp as the northern boundary. It has been heavily logged at least twice, the latest being in 2004 just prior to being donated to the town. The cutting left areas with a few large (18-28" diameter) multi-stemmed white pine. The majority of the trees were young (8-14" diameter) mixed oaks, red maple, birch and hemlock. There are a few young white pine pole-sized and good quality pine scattered throughout the site. The area abuts a heron rookery and beaver ponds. The heavy cutting opened the ground to sunlight and as a result there has been a regeneration of white pine, blueberry and other light sensitive trees and shrubs.

In 2007 the forestry operation included a thinning operation. The majority of the old pines remaining were removed except along the beaver ponds and other wetlands – there is a possibility the heron will use these trees when their existing dead pines fall. The younger

stands were also selectively thinned to enhance future growth. A 3-acre area around the large drilled rock was cut heavily in order to open the large under-story of new blueberries, to encourage hardwood sprouts and to create open space not previously available. Selected mature mast trees were left to provide a food source for the many species using acorns for food especially during the winter. Deer browse has been observed and turkey and other birds use the area. Owls have been seen hunting around the opening. The large rock at the edge of the opening contains over 100 hand-made drill holes and is an interesting sight.

Wildlife: This forest stand runs along the Red Maple Swamp (Stand J) and the associated wetlands so undisturbed buffers were maintained. Due to the importance of the wildlife *habitat*, the logging *trail* accessing this area was blocked to prevent motorized vehicle disturbance to the wildlife.

Forestry Plan: The open area needs to be maintained as an important feeding resource for the wildlife, maintenance will probably involve selected hand cutting so as not to disturb the blueberry crop. The heron rookery is still losing trees and there are no signs of new nests. Ducks use the pond and are active in the many boxes provided. Beaver have been seen in the pond.

Stand J (2007)
Red Maple / Black Ash / Saxifrage Swamp, 6.8 acres

Observation: This area has been classified as a "Red Maple-Black Ash-Swamp Saxifrage Swamp" *natural community*. The *Biodiversity* Conservation Plan determined that it is an area of special concern due to the rarity of this *natural community*. It is a narrow forest stand located south of an old logging road and drains an area to the east. The marshy ground and poorly drained soils have created a red maple overstory with some hemlock brush, mountain laurel, ferns and similar vegetation. It is a portion of a fairly extensive wetland complex that feeds the large beaver pond along Beebe Lane and shortly thereafter into Baboosic Lake.

Running the length of the swamp on the north is an old logging road, probably created in the 1970's and used in the 2004 logging operation in this area. The logging road has steep slopes draining the hillside towards the swamp.

Wildlife: Many amphibians, birds and small mammals use this area.

The old logging roads, heavily traveled by various users, traverse many steep slopes and seasonally wet areas. These *trails* are badly deteriorated. There are extensive areas under water whenever it rains and mud holes are common. A stream has eroded across and along the *trail*. Eroded soils are washing into the swamp and degrading the quality of the wetlands. A rehabilitation of the old logging road to include proper drainage controls and establishment of a stable surface is required to prevent further degradation. Potentially NH *DES* ARM funds may be available under wetland rehabilitation grant

guidelines. Due to the importance of the *natural community*, the area is of prime importance for immediate attention.

A rehabilitation plan was prepared in 2010, it is currently being acted upon and is scheduled to begin in the Summer of 2013.

Forestry Plan: With the exception of rehabilitation of the old logging road described above, this sensitive area will be left alone.

Stand K (2007)
Well stocked mixed hardwoods

Observation: This stand is located along the rear lot lines of private homes. It extends from the large beaver pond on the west all the way to the homes on Conservation Drive. This area was also logged prior to donation to the town. It contains red maple, red oak, and scattered "wolf" pine up to 20" in diameter. It contains some quality saw timber on the medium slopes. Soils are moist and fairly well drained. There is no usable access point to this forest stand; the earlier entry is now a house lot.

Wildlife: Due to the mature mast trees there are abundant signs of deer and other wildlife. There is a historical record of a hognose snake sighting on the western end. A recent sighting was made, with photograph, of a bobcat in this area.

An old foundation is found with an extensive stone wall system in the vicinity of the rear lot line. The history of the site should be researched.

Forestry Plan: Due to the lack of access this area should be permitted to mature naturally without any logging. Refer to the comments concerning access from private lands in the Stand J forestry plan. Any "party spots" found should be removed as open fires in this area pose a substantial threat as firefighting equipment would have difficulty accessing this area.

Stand L (2007)
Upland Oak and hardwoods, 2.5 acres

Observation: This small stand is located on a steeply sloped area abutting the Conservation Drive turn-around on the east. It is composed of well-stocked oak poles and small saw timber of 8-16" Diameter at Breast Height (*DBH*) with some hemlock in the understory. Beech and red maple are also found here.

Wildlife:

Forestry Plan: This area will be the location for the access from Conservation Drive into the Red Maple Swamp system. The boundary line has been marked and will require monitoring due to the proximity of the house on the abutting lot. Construction of the

access way into the lower area will impact this stand and perhaps the recommended thinning can be included as a means of obtaining funds for the project. A review of the area with the forester and the Public Works Department (PWD) was completed in the spring of 2011. See the rehabilitation plan discussion in Stand J.

Stand M (2007)
Well stocked mixed wood (mainly hardwood)

Observation: This large stand runs from Stand l all the way to the eastern boundary of Grater Woods. On the north it shares a boundary line with many of the homes located on Marty Drive. On the southern side it borders a substantial wetland complex, an active beaver pond, a beaver meadow and the connecting brooks. The stand consists of small groups of scattered red oak, hemlock, white oak and red maple ranging from 8-14 *DBH*. Scattered white pine, 16-22 *DBH*, provide a "super-canopy" over the general over-story. Regeneration from a cut, probably at the time the adjoining houses were built, consists of mountain laurel, beech, herbaceous and hardwood shrubs, blueberries and maple-leaved viburnum from 1 to 4 feet in height. The understory is as variable as the larger trees and range from dense brush to virtually no ground cover under the hemlocks. Soils are moderately well-drained, rocky and the terrain undulates a fair amount.

A *trail* runs the length of the parcel but at times is also on private land. School children use a portion of the *trail* and cross the brook between the ponds to get to the Middle School. Signs of motorized vehicle use are found along the *trail* and into the woods.

The Education Center Plan includes developing an Environmental *Trail* through this parcel. Included is the construction of a bridge over the stream between the ponds and a means to cross the bog portion of the beaver meadow. Portions of the *trail* will also be on Stand N. Projects like this are well suited as projects for Eagle Scout candidates.

Access into this stand is questionable. The town owns a 50' wide strip of land running from Marty Drive between two houses and back to this parcel – apparently it was originally designed as a roadway for further development. It has not been used for access in the past so it will need attention if a forestry project is planned. There is no other access to this parcel.

Wildlife: Wildlife *habitat* openings and similar projects should be included. Efforts should be made to improve the beaver *habitat* near the wetlands as they are key to the long term stability of the wetland *habitat*. In the area of the beaver ponds, the heavy hemlock cover should be removed along with mature red maples and birch in order to increase the amount of hardwood saplings for feed. Hardwoods up to 8 inch diameter should be retained for use in building dams and lodges. Large white and red oak should be left for production of mast for wildlife using the beaver-enhanced wetland areas.

Forestry Plan: This stand was probably last cut at the time of the Marty Drive development in the 1980's. There are both mature and young trees that are due for a

thinning to encourage proper growth. There is a need for light on the forest floor in several locations with heavy hemlock over growth. It is suggested to thin out of the low quality and mature trees while maintaining some of the low hemlock growth for deer shelter. A biomass harvest is indicated to keep the forest floor open for recreation. The skidder roads should be located to create a *trails* system.

Due to the size of the forest and the mixed timber quality a timber harvest may be costly depending upon the access issue. If a mechanized forestry project is not feasible perhaps hand cutting of the trees along the beaver pond, as a *habitat* improvement project should be considered.

Stand N (2007)
White Pine overstory with good hardwood component

Observation: This stand is located in the southeastern corner of Grater Woods. It abuts the rear of the Middle School and has easy access from the parking lot. The stand consists of a 6-acre pine and hardwoods stand overlooking the beaver meadow and adjoining a brook. There is direct access from the Class VI Old Blood Road and school children often use this area to walk to school. The parcel is a fairly narrow strip extending the full distance westerly behind the school and ending at the beaver pond in the area of a small hill overlooking the pond. The abutting school land contains a walking *trail* system that at times extends over onto Grater Woods.

Wildlife: Beaver occupy the upper remaining pond and have rebuilt the dam that blew out in 2006. The lower pond also blew out in 2006 and has not been rebuilt. There is a shortage of trees suitable for beaver use along the edges of the ponds. The lack of building materials and lack of food has changed the *habitat* so it is marginally supportive of a beaver colony. Without action on our part the beaver may abandon the site and they are already quite active downstream. The Beaver Meadow is now abundant with a growth of grasses and small trees and shrubs are now appearing. Over the next 10-15 years the meadow will gradually develop into an early successional forest and the beaver may return again.

Ducks have been observed on the active pond along with heron. Duck boxes were installed in 2007 and destroyed in 2008 – they were not replaced. The pond shoreline is within Stand G and regeneration of hardwoods is underway in this area.

Forestry Plan: The area directly behind the school building was forested in 2007. The principle goal was to clear an area for an educational center for use by students and other citizens based upon discussions with Project Learning Tree ® and the Middle School teachers and staff. Refer to Section 6 for information about the GWOEC.

Stand O (2011)
Red Oak/Hardwood sawtimber

Observation: This stand, located in the northwestern quarter of the property, consists mostly of red oak *sawtimber* 12-26" in diameter with some white pine, sugar maple, red maple, and white ash 12-20" in diameter. Some very large individual stems of white oak, beech, and sugar maple (24-40" in diameter) can also be found tucked away in this stand, mostly found in the stream valley on the eastern edge of this stand or along the stone walls found running through the middle of the stand. In between the larger overstory crowns are intermediate and suppressed crowns on hardwoods that are 8-10" in diameter, mostly red oak, white oak, white pine, red maple, and sugar maple. Much of the white pine found in this stand has either grown poorly due to competition with the oaks for sunlight or white pine weevil damage. Regeneration throughout most of this stand is rather sparse due to the heavy overstory shade, although some hickory saplings 2-4" in diameter could be found, along with some witch hazel shrubs growing near the forest floor. The terrain is gently rolling, and generally slopes to the east with grades of 2-10%. A stream runs through the eastern edge of this stand and flows southeast into the beaver ponds; another stream flows from the center of this stand out of a hillside spring and joins the first. Soils are well-drained at the tops of the knolls in the western half of this stand, somewhat poorly-drained along the streams in the eastern half of the stand, and overall are moderately well-drained, with very little surface rock except near streambeds. Parts of this stand were clearly used for agriculture, as the stone wall running through the middle can testify.

Access to this stand is fair, given the proximity to Grater Road, although very little access has currently been established.

Wildlife: Wildlife usage of this stand is very good, both for feeding and travel. The presence of water, the proximity to open fields to the west (off the property), and the availability of hardwood mast all contribute to make this stand a beneficial area for wildlife.

Forestry Plan: This stand is currently overstocked to produce good hardwood *sawtimber* or excellent hard mast and would respond well to a light thinning that would remove about a quarter of the basal area. Such a harvest would remove most of the poorly-formed trees of all species, as well as thin out some of the more mature white pine and red oak *sawtimber*. This thinning should allow smaller-diameter co-dominants to receive more sunlight and therefore increase in the rate of diameter growth. Such a harvest would remove about 26 cords of pine pulp and low-grade cordwood trees, as well as roughly 12 *MBF* of oak *sawtimber* and 6 *MBF* of white pine timber. Such a harvest would result in a well-spaced stand of quality hardwoods and some pine, with a residual basal area between 100-115 sq. ft./acre. This harvest would also allow sunlight to reach down through the gaps in the canopy to the forest floor to encourage new seedlings to be established, preferably white pine seedlings and oak stump sprouts.

In managing this stand, planners should consider identifying a few large, older individual trees that have endured decades of transitions and remain standing and healthy. Particular attention should be given to a few of the large white oak, sugar maples, beech, or black gum located in the stream valley or along stone walls, particularly those trees that have few crop trees around them. These older trees could be tagged or otherwise identified as "legacy trees" to preserve into the future. Some thinning could be done around them to keep them from being out-competed by faster-growing younger individuals that are more vigorous; however, care should be taken not to over-thin around these trees and make them susceptible to wind damage. These trees, particularly the white oaks, tend to be poorly-formed for *sawtimber*, but generally produce abundant hard mast, so they are valuable both as a well-established gene source as well as for wildlife food.

Stand P (2011)
Weeviled White Pine sawtimber with mixed hardwood sawtimber/poles

Observation: This large stand, making up the remainder of the western half of the property, consists mostly of large white pine 12-24" in diameter mixed with some hardwoods 12-18" in diameter, including red maple, red oak, white ash, and black birch. Some white oak of similar size can be found scattered throughout this stand as well. Most of this stand was old pasture before reverting to forest, and much of the mature white pine suffers from weevil damage. Most of the pine pulp consists of large, poor-quality trees, as opposed to young growing stock that has not reached *sawtimber* size yet. The understory consists mostly of red maple poles 4-10" in diameter, along with black birch, white oak, hickory, black oak, and red oak of similar size. For the most part, this appears to be an even-aged stand, which would fit with the growing history of this area. No harvesting appears to have taken place in this stand over the past 30 years. Regeneration ranges from some good patches of white pine seedlings 0-2' tall to some saplings 2-5' tall. Also found near the forest floor are scattered red maple, white ash, and some sugar maple poles 1-2" in diameter 10-20' tall, along with scattered hemlock 2-4" in diameter of similar height. Soils are generally well-drained or moderately well-drained with pockets of wet or very poorly-drained soils scattered here and there. The terrain is rolling and generally slopes to the south and east with grades ranging from 2-5% on flatter areas to 5-10% on hilly sides. There is very little surface rock, probably due to the agricultural history of the land. This stand has a fair amount of live blowdown in white pine, as well as many standing dead pines (either due to droughty conditions and poor rooting depth, or over-crowding). Overall, it seems that the hardwood is faring better in this stand and white pine, although management could probably help direct the stand one way or the other. Given the history of this ground and the areas of poor quality overstory pines, this stand could make an excellent area for building a field or wildlife opening, especially one that could overlook the pond to the east. Given the proximity to the beaver pond, this stand acts as a transitional stand and travelway for wildlife seeking cover as they go to drink. It is also very valuable as a hunting ground for predators seeking smaller animals that use the pond on a regular basis.

Wildlife: Keeping the wildlife use of this stand in mind, the eastern strip of this stand immediately adjacent to the pond should be managed more for wildlife benefit than straight silviculture. A suitable field location should be identified and harvested (perhaps an enlargement of the proposed landing area), with good access to the road for future maintenance of the field. Tall trees and snags should be left on the edge of the field area and by the pond to provide raptor perches – this may mean leaving some good pine *sawtimber* to remain past conventional rotations. On the other hand, it would be good to leave these tall softwoods along the northern edges of the field, since those same trees could throw undue amounts of shade on the new field areas if left too far south – the southern and western sides of the field should be mostly mature hardwood. As a transitional area providing cover, this stand should maintain as much of its oak as possible for hard mast for wildlife.

Forestry Plan: This stand would benefit greatly from a thinning that would remove most of the weeviled white pines, leaving the taller and straighter trees to increase in diameter after competing trees have been removed. Such a harvest, especially if coupled with field clearing, would be best done as a biomass (whole-tree chipping) operation, or else with a crew that removes much of their pine pulp. Such a harvest would help to keep fuel loads following a harvest to a minimum, and will result in a very clean operation aesthetically. Larger wolf pines should be removed around straighter trees, while maintaining enough stocking so that remaining trees do not blow down. Crooked trees should be removed before straight trees, and trees with weevil defects low on the tree should be removed before trees with defects higher up the stem. Such a harvest should remove about a third of the basal area, around 85 *MBF*, of white pine *sawtimber* (leaving the straighter trees to grow into the future), as well as 10 *MBF* of red maple and 2-4 *MBF* of red oak. This harvest should also yield about 90-100 cords of firewood and 150-160 cords of softwood pulp, mostly weeviled white pine.1 This should result in a residual stand of about 90-100 square feet of basal area per acrealthough patches of heavily-weeviled trees will yield lower residual basal areas until trees grow back.

Stand Q (2011)
Mixed White Pine/Oak sawtimber over hardwood poles

Observations: This stand, located north of the beaver ponds, consists mostly of large (16-24” DBH) overstory white pine mixed with red, black, and white oak, hickory, and red maple *sawtimber* 12-18” in diameter. Intermediate trees in the overstory include red maple, hickory, black oak, red oak, and black birch poles 8-10” in diameter. A few suppressed white pine poles of similar size can be found scattered around the stand. Regeneration is limited under the shady canopy, consisting of some white pine seedlings 1-6’ tall and some hemlock and white pine saplings 24” in diameter 10-20’ tall. Soils are well-drained and sit on rocky, rolling south-facing hillsides. This area does not appear to have the more aggressive agricultural history that was found in Stand P. The extension of Grater Road that leaves the northern boundary line and cuts through this property enters in this stand, staying far enough away from the beaver ponds to avoid flooding.

The presence of oak and hickory in this stand encourages mast-eating wildlife. Access to this stand is fair, if Grater Road were fixed and proper drainage were installed to allow water to flow under the road instead of over it.

Wildlife:

Forestry Plan: This stand would benefit from a harvest that removes about a third of the overstory stocking from the stand, thinning out poorly-formed trees, some of the larger overstory white pines, and thinning in between the oaks and maples, specifically removing more of the black oaks. Such a harvest would remove about 10-15 *MBF* of white pine timber, 5 *MBF* of mixed oak timber, and roughly that amount of white ash and some red maple. This harvest would also remove at least 10 cords of softwood pulp, mostly weeviled white pines that have little *sawtimber* value. Such a harvest would help expose sunlight to the advance regeneration on the forest floor as well as thin around future crop trees.

Stand R (2011)
Short hill-top Red Oak sawtimber with mixed hardwood poles

Observations: This stand, located near the northeastern corner of the property, consists mostly of stunted red oak *sawtimber* 12-18" in diameter mixed with various hardwood poles 8-10" in diameter, including white oak, black birch, black oak, red oak, and red maple. A few scattered white pine 10-18" in diameter can be found throughout the stand as well. This stand is fairly tight and not yet mature, and so regeneration is sporadic, with some hemlock and white pine 2-4" in diameter, 10-20' tall. Soils are rocky, well-drained, and slope to the south with grades of 10-20%. Access to this stand is only fair, given the terrain and the poor quality of Grater Road to this point. This stand may have been clearcut at one time and allowed to grow back.

Wildlife:

Forestry Plan: This stand would benefit from a light thinning that only removes some of the trees competing with future crop trees as well as taking out some of the obviously poorly-formed trees. This harvest should also allow sunlight to reach the forest floor to help establish new regeneration and encourage the advance regeneration to grow even more. Such a harvest should yield only about 4*MBF* of red oak, and 10-15 cords of firewood, resulting in a stand with about 100 square feet of basal area per acre.

Care should be taken not to overharvest on these thinner soils, and that harvesting operations maintain enough shade on the southern side of oaks so that the future crop trees do not start epicormic branching, thereby losing their value.

Stand S (2011)
Short hill-top mixed Oak with Hemlock understory

Observation: This stand, located in the northeastern corner of the property, stretches from the northern boundary down to the eastern beaver pond. It has a similar overstory composition as that of Stand R, with mixed oaks 12-18" in diameter growing with some white pine *sawtimber* of similar size. What distinguishes these two stands, however, is the increased hemlock component in this stand, with some hemlock *sawtimber* 14-18" in diameter scattered throughout the overstory, and dense hemlock undergrowth 8-20' tall and 1-3" in diameter. There is also a pole component of hemlock 6-10" in diameter found in this stand mixed with the oak, red maple, and hickory poles. Soils are well-drained, thin to bedrock, and on steeper south-facing slopes averaging 10-20% grades. Access to this stand is currently rather poor.

Wildlife: The southern edge of this stand shows the most impact from the beaver activity, with freshly-chewed white oaks and the roadbed of Grater Road flooded out for about 200'. Between the road flooding and steeper slopes,

Forestry Plan: This stand would benefit greatly from a thinning that would remove some mature and poorly-formed stems to encourage growth on residual crop trees. Such a harvest would remove about 5 *MBF* of red oak *sawtimber*, 7 *MBF* of white pine timber, and 3-4 *MBF* each of black oak and hemlock *sawtimber*. In addition, this harvest should remove about 25-30 cords of cordwood and and about 20 cords of pulpwood, mostly hemlock. As with most other stands, this harvest would focus on removing trees with poor, thin tops, trees with massive tops taking up too much canopy space, and trees that fork lower to the ground than their neighbors. This light thinning should result in a stand with about 100 square feet of basal area per acre.

Unless access to the eastern half of this property can be created south of the beaver ponds (over the stream flowing out of the pond and up the steep hill into the western edge of Stand T, this stand will be critical for reaching the causeway that turns south off of Grater Road near the edge of the property and down into Stand T. Given the flooding problems associated with the beavers, and assuming that no action will be taken to remove beaver dams to free up the historic path of Grater Road, an access road (cut and fill) should be created parallel to the old Grater Road, high enough to prevent future flooding should the beavers continue to build higher dams.

Stand T (2011)
White Pine/hardwood sawtimber

Observation: This stand, making up most of the southwestern side of the property on the far side of the beaver ponds, consists of good white pine *sawtimber* 12-24" in diameter mixed with hardwoods 12-20" in diameter, mostly black oak, as well as some red oak, red maple, and white oak. A small amount of pitch pine 10-16" in diameter can also be found distributed throughout most of this stand. There is a strong pole component of

hardwoods with the same species composition as exists in the overstory. A fair amount of white pine poles and some pitch pine 6-10" in diameter can also be found in this stand, although one-third of the softwood pulp consists of larger overstory weeviled white pines. Overall, there is very little regeneration found on the forest floor of this stand, with only some pockets of white pine saplings 3-6" in diameter, and some areas of white pine seedlings 0-3' tall carpeting the ground. Of greater concern are the areas of standing dead white pine poles found in some areas of this stand, which raises the question of over-crowding (which is manageable) or drought-kill due to poor rooting depth (much harder to manage). Access to this stand is currently rather poor, given the flooded section of Grater Road in Stand S. However, the causeway in the northeastern corner of this stand that leads out to Grater Road is still intact and could certainly be used for skidding in the future. At present, a footpath leads from the road south to the powerline. The powerline right-of-way cuts through this stand, with a small area of forestland on the southern side of the lines. This stand is nearly bisected by Stand U, essentially creating a finger of this stand that runs down the eastern boundary line of the property, with the bulk of the stand west of Stand U.

Wildlife:

Forest Plan: This stand would benefit from a thinning with similar goals as that of Stand P, removing most of the weeviled white pine and a high percentage of black oak from the overstory, allowing the best crop trees (white pine, red oak, red maple) to increase in diameter for the future. White oaks should generally be left scattered throughout this stand to provide food for wildlife. This harvest would remove about 60 *MBF* of white pine, 40 *MBF* of black oak, and another 10-15 *MBF* of other species, along with roughly 100 cords of firewood and 75 cords of pulp.

Stand U (2011)
Mixed Hardwood sawtimber/poles on moist ground

Observation: This small stand, located between the large wetland on the southern boundary line and the easternmost beaver pond, is an area of red maple and other mixed hardwoods growing along the drainage flowing south-to-north into the beaver pond. The overstory varies with the soils and water table, with red maple, red oak, white pine, hemlock, and yellow birch ranging from 8-24" in diameter. Soils are rather poorly-drained, more so in the south than the north, and tends to be rocky, sloping to the north with grades of 1-5%. Regeneration consists mostly of mountain laurel 2-5' tall. This stand should not be accessed directly for harvesting purposes, but may be reached from the edges through Stand T. This stand serves as a good filter strip and funnel for water leaving the wetland on the powerline on the southern boundary line and flowing north into the beaver ponds.

Wildlife:

Forestry Plan: Since this stand is not heavily stocked, the soils are poor for harvesting purposes, and it provides a good area of undisturbed water flow into the beaver ponds, this stand should not be targeted for high-intensity management. However, given that there is some timber value that could be accessed from the edges of the stand (value that will most likely blow down and be wasted because of poor rooting depth), managers should consider reaching into this stand from Stand T to remove some of the value out of the overstory, maintaining a well-shaded overstory for water quality purposes. This thinning should also seek to remove competition from larger oaks found on the edges of this stand, so as to encourage them to produce more mast for wildlife.

Section 3 Water and Soil Resources

Quality of water resources are also a prime concern as Grater Woods is located in the Baboosic Lake and Baboosic Brook watersheds, two areas of high *biodiversity* interest. Approximately a third of the Grater Woods property has been classified as wetlands, specifically open beaver ponds or open marsh with standing water and vegetation. Wetlands provide numerous benefits, but require active management to remain healthy.

Soils and Terrain

Many of the numerous ponds, pools, streams and wetlands on Grater Woods are surrounded by forest. This essential feature aids the health of the property by preventing erosion, siltation of lawn chemicals, and heavy metal runoff from pavement, off of surrounding roads. This natural filtration system along with the moderately well drained, rocky soil that slopes to the center of the property is key to the healthy state of open water on the property.

Much of the outlying edges of the property can be generally characterized as rolling hills, with a few flat spots, dotted with *vernal pools*, all of which are essential terrain features that provide for much of the aquatic amphibian life, and sustains the fowl and mammal inhabitants as well.

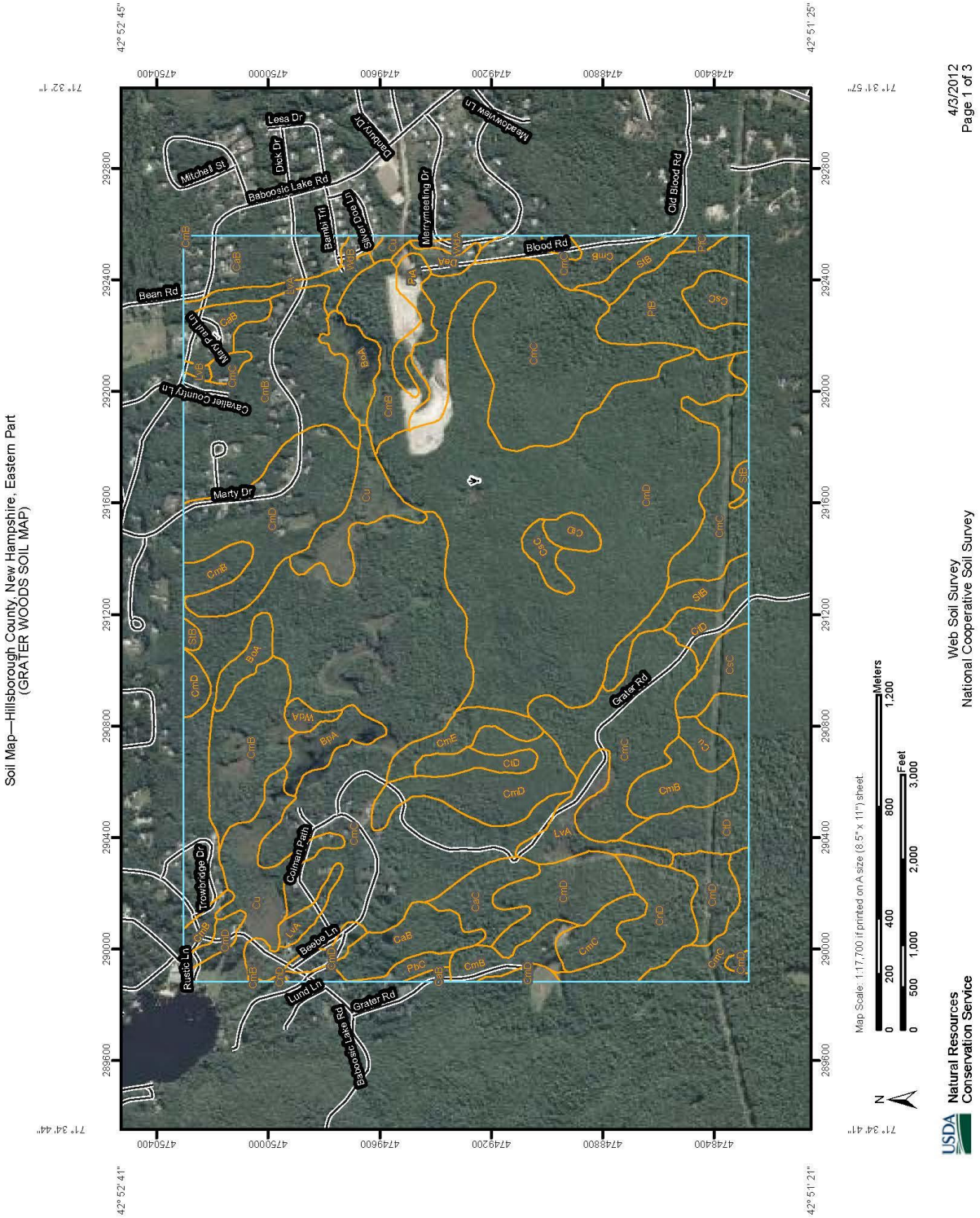
The terrain of the Grater Homestead parcels are somewhat unremarkable, ranging from areas of gently rolling former agricultural fields and pastures to areas of rolling hills and wide, flat stream valleys with poorly-drained soils.

Riparian and wetland areas are the places that open water and upland sites meet. *Riparian areas* are important for a number of reasons. They offer critical *habitat* for many wildlife species, providing shelter, food, water, and travel corridors. They are also very useful for flood control by acting as a sponge during times of high water volume, and then releasing that water slowly and consistently over time. Without wetlands, streams would fluctuate greatly between periods of high flow and dry streambeds. Finally, *riparian areas* are key for filtering water as it travels from upland sites to the open water, keeping out many chemical impurities and keeping water silt-free.

Notable terrain features associated with this property are the conglomeration of beaver ponds. These ponds create a “bowl” toward which the rest of the property slopes. Grater Road forms a boundary and is the height of land between two watersheds; everything north of the Grater Homestead parcel flows north into Baboosic Lake.

The wide wetland found at the southwestern corner of the Grater Homestead parcel offers a very different wetland *habitat* than the beaver ponds. The former is flat, poorly-drained, and covered with low-growing wetland shrubs and water-logged soils. The latter is actually ponded water with more than 5’ of depth due to beavers damming up stream channels. Both wetland types offer *habitat* for their own particular wildlife species.

Grater Woods Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:17,700 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsborough County, New Hampshire, Eastern Part
Survey Area Data: Version 12, Mar 22, 2012

Date(s) aerial images were photographed: 9/10/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Hillsborough County, New Hampshire, Eastern Part (NH601)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BoA	Borohemists, nearly level	17.4	1.3%
BpA	Borohemists, ponded	11.5	0.9%
CaB	Canton fine sandy loam, 0 to 8 percent slopes	55.3	4.1%
CaC	Canton fine sandy loam, 8 to 15 percent slopes	14.3	1.1%
CmB	Canton stony fine sandy loam, 3 to 8 percent slopes	180.0	13.4%
CmC	Canton stony fine sandy loam, 8 to 15 percent slopes	420.5	31.4%
CmD	Canton stony fine sandy loam, 15 to 25 percent slopes	361.0	26.9%
CmE	Canton stony fine sandy loam, 25 to 35 percent slopes	12.4	0.9%
CnD	Canton very stony fine sandy loam, 15 to 35 percent slopes	24.9	1.9%
CsC	Chatfield-Hollis complex, 8 to 15 percent slopes	26.4	2.0%
CtD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	46.5	3.5%
Cu	Chocorua mucky peat	57.4	4.3%
DeA	Deerfield loamy fine sand, 0 to 3 percent slopes	4.7	0.4%
LvA	Leicester-Walpole complex stony, 0 to 3 percent slopes	29.4	2.2%
LvB	Leicester-Walpole complex stony, 3 to 8 percent slopes	1.1	0.1%
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	4.0	0.3%
PfB	Paxton stony fine sandy loam, 3 to 8 percent slopes	30.9	2.3%
PfC	Paxton stony fine sandy loam, 8 to 15 percent slopes	1.8	0.1%
PiA	Pipestone loamy sand, 0 to 3 percent slopes	9.2	0.7%
StB	Scituate stony fine sandy loam, 3 to 8 percent slopes	23.2	1.7%
WdA	Windsor loamy sand, 0 to 3 percent slopes	6.1	0.5%
WdB	Windsor loamy sand, 3 to 8 percent slopes	2.5	0.2%
Totals for Area of Interest		**1,340.5**	**100.0%**

Management Objective:
A management objective for Grater Woods is to protect, Improve and enhance wildlife *habitat* for multiple species. “One of the big concerns for the property is wildlife *habitat*. Much of what makes this corner of Merrimack so appealing for many different species is the presence of water. The water is only located on this property because of the beavers. By maintaining the beaver population, the beaver ponds will remain as an open water *habitat*, which in turn will sustain the plethora of wildlife species that use this forest.”(Forest Stewardship Plan: Brian E. Johnson, 9/25/07)

Strategies for implementation of this management objective include:

- Locate, catalog and post all Ponds, *Vernal Pools* and Wetlands
- Assess and define the present state of each site
- Establish a long term Stewardship objective for each
- Create well defined buffer zones and no-cut zones in *riparian areas*
- Precluding the further demise of fertile wetlands by creating a regulated and defined *trail* system, managed with attention to Best Management Practices in regards to open water and surrounding *riparian areas*
- Educate users and town citizens in general as to the regulations and consideration in regards to sensitive nature of the wetlands
- Construct and set up a long-term maintenance plan for the system of well-defined *trails*, which include bridges, boardwalks and footpaths
- *Trails* designed for motorized use shall be designed to enhance access and viewing while not causing damage to ecologically sensitive wetlands
- Maintain a record of the activity taking place in all designated wetland areas

NOTE: *Hemlock Wooly Adelgid is an insect now found at Twin Bridges in Merrimack. Over time it will cause the death of infected hemlocks and at this time means of control are still in the evaluation stage with the Twin Bridges infestation being one of the test areas. The NH DRED Division of Forest and Lands, Forest Health Program has conducted a survey in Grater Woods hemlock stands and found no sign of the insect. They will continue to monitor the area with the knowledge that loss of the hemlocks would create a major change in the health and the wildlife habitat in Grater Woods.*

Section 4 Wildlife and Habitat Management

The goal of Wildlife and *Habitat* management of Grater Woods is to help create and maintain a conducive environment for native wildlife species to thrive.

Overall, this property has general *biodiversity*, along with some unique *habitat* types. The red and white oaks produce hard mast, as do the hickories and beeches. These trees provide nuts for many mammals and some birds. By allowing the oak crowns more space, they will be able to expand and enlarge, which in turn will increase their photosynthetic capabilities. This increase in energy production allows the tree to focus more energy on reproduction, which increases the amount of mast on a given tree. These oaks are essential for providing deer, turkey, and many small mammals with protein-packed food to eat during the fall months in preparation for winter. By increasing the small mammal population, larger predators such as weasels, foxes, coyotes, bobcats, and raptors have more abundant food with which to feed their own young. Various species of hawks and owls lurk in the surrounding overstory trees.

While forest management would do much for general wildlife *habitat* needs, the lack of management has also benefited one species in particular. In allowing so much standing wood become suppressed, diseased, and eventually die off, many trees have become prime feeding grounds for pileated woodpeckers.

Of particular importance to wildlife diversity is the presence of actively managed fields abutting mixed forest types (found mostly to the west of this parcel). The fields are used by deer, turkey, geese, and many small mammals, which in turn draw larger carnivores and raptors. The stands closest to these fields are used extensively by birds and mammals alike for shelter and cover on their way to feed in the fields. To improve wildlife habitats on this property, it would be beneficial to create field openings within the boundaries that could be periodically mowed. It would be especially helpful if large, mast-producing oaks are left to grow along the edges of these fields to provide extra food.

The presence of beaver ponds offers a *habitat* type that is not available on most New Hampshire woodlots, Wildlife professionals typically assert that the presence of ponded areas within a forest greatly increases the diversity of wildlife populations. The water offers *habitat* for a number of invertebrates, small mammals, birds, reptiles, and amphibians, which in turn draw the attention of larger predators such as great horned owls and herons.

Two of the biggest threats to biological diversity today are loss of *habitat* to non-forest uses and invasive species. Since this property is mostly forest, it is understandable that some forested areas that are suitable for maintainable wildlife openings will be cleared for fields. Fields actually provide extensive wildlife benefits to a number of birds and small mammals. The important part of this loss of forestland is that it is not being built on or developed, which is truly the bigger danger to *habitat*.

One of the other concerns for aquatic wildlife on this particular piece of property is the high amount of sediment that is churned up and dumped into streams (and eventually into the ponds) by 4-wheelers and "mud trucks" using the road systems at inappropriate times of the year.

Major Ecosystems:

There are three major ecosystems in Grater Woods that encourage wildlife:

1. **Oak/Pine forest**
    - Oak, Beech and Hickory nuts provide food.
    - Dense stands of conifers provide thermal cover for deer during winter.
    - In a *forest landscape*, restoration and maintenance of large native forest patches with small openings of native forbs and shrubs is appropriate and benefits forest songbirds, bear and deer.
2. **Wetlands**
    - Provide a variety of biological functions and are among the most productive ecosystems in the world. They provide diverse wildlife habitats and support complex food chains.
    - Enhance the *habitat* for a variety of wildlife such as cavity feeding waterfowl and other nesting birds (trees killed by flooding support nests of heron, egrets, ospreys and other birds), aquatic Invertebrates, reptiles, amphibians and other wetland mammals.
3. **Vernal Pools**
    - Provide a seasonal wet area for creatures such as newts, salamanders, turtles, snakes, toads, frogs and insects.

Wildlife Openings:

Wildlife openings are sections of the forest that have been cleared of significant overstory. This allows for regeneration of shrubbery, low bush fruits and saplings, which attract a variety of aviary and mammalian wildlife. These openings are identified on the *trail* map as:

- Gateway Junction
- Deer Crossing
- Blueberry Meadow
- Barred Owl Range

Hunting:

Hunting has been shown to be a viable way to control local wildlife populations. The *MCC* recommends that hunting continue to be allowed on Grater Woods, with the exception of the parcel owned by the School District due to a restriction in the property

easement. Hunters must follow all New Hampshire Fish and Game Department regulations.

Management Objectives:

Management activities that will positively impact Grater Woods include:

1. Identifying and controlling invasive species
2. Preserving existing *habitat*
3. Recovering rare species
4. Land Stewardship and rehabilitation
5. Protecting known wildlife shelters in the oak/pine forest such as deer bedding areas and raptor nesting sites

Of these ecosystems, special attention should be given to the protection of wetlands and *vernal pools*. Roads and motorized use should be located away from wetlands and *vernal pools* whenever possible.

Section 5 Trails

Trail Categories:

The Grater Woods *Trail* System currently includes four categories of *trails*. Each category will be representative of the type of usage the *trail* was designed to support. Mis-use or abuse of Grater Woods or its *trail* system will be reported to local authorities. Each category is identified on the *trail* map using a unique graphic line format and color. The color used on the map to identify each category will be used to mark the *trails* themselves. By using a unique graphic on the map, the *trail* category can be distinguished even when the map is printed in black and white. The use of different colors to mark the *trails* will assist the less experienced users in understanding where they are within the woods. Posts are placed at critical junctions with *trail* names, directional arrows and, in some cases, special "street signs" in order to make the large forested area as user-friendly and compatible with the primary *MCC* Master Plan goals.

The *trail* categories are:

Category A – All Users - Designated with Yellow Rectangular markers. Category A *trails* will generally be wide, cover gentle slopes and be easily followed. Foot traffic will have the right of way.

All users are permitted including foot traffic and pedaled bikes, dirt bikes, *ATVs, snowmobiles* and horses. *ORV* traffic would not be permitted. These *trails* are limited to locations of selected upgraded logging roads.

Category B – Walking Trails - (non-motorized) Designated with Light Blue Triangular markers. Category B *trails* may be located in the woods and may contain moderate slopes, wide enough for one or two people to walk side by side and require more skill and energy to traverse. Short unnamed dead-end *trails* to view special features and to provide resting spots will be indicated and marked but not named in most instances.

Trails are open to foot traffic and pedaled mountain bikes.

Category C – Special Use - (non-motorized) Designated with Red Circular markers. Category C *trails* may be challenging to navigate and will often have minimal *trail* markings making it harder to stay on the *trail* unless the user is experienced in the woods. Users of these *trails* should be able to follow a *trail* in the woods and be able to judge seasonal conditions.

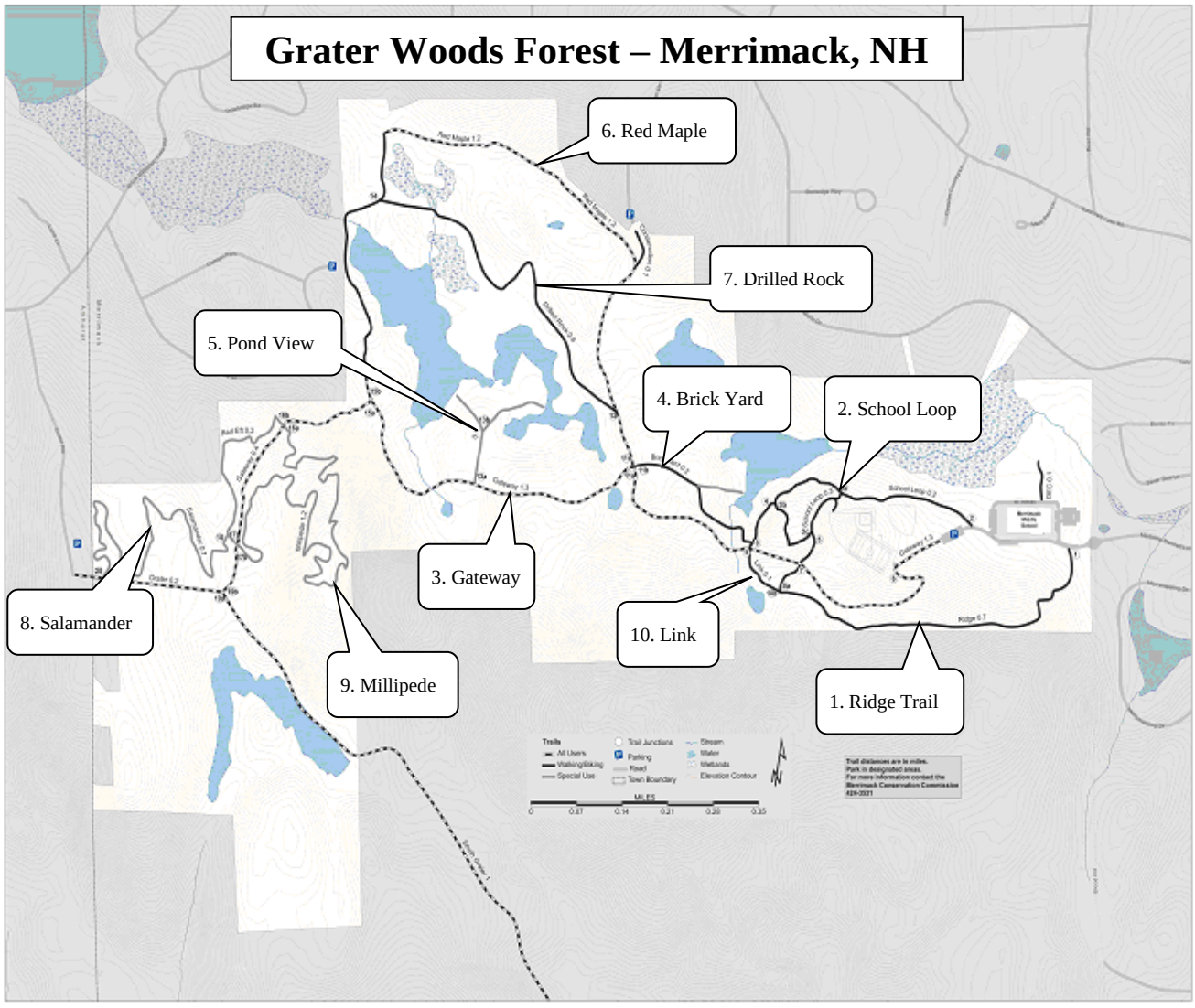
Trails are open to foot traffic and pedaled mountain bikes. Category C *trails* may only be open seasonally when ice conditions allow crossing of frozen ponds and/or *trails* that may only be accessible during the drier seasons.

Category D – Special Use – (motorized) Designated with Orange Square markers. Category D *trails* will generally be narrow, cover moderate slopes and be easily followed. Foot traffic will have the right of way.

Uses permitted include foot traffic, pedaled bikes, *trail bikes*. *OHRVs, ATVs, snowmobiles* or horses would not be permitted. These *trails* are limited to selected locations removed from the general *trails*.

Trail Descriptions:

The *trails* on Grater Woods, as of April 2011, are identified in the following map and are described in this section. A larger version of this map is provided in Appendix A. The *trails* will change over time; refer to www.merrimackoutdoors.org for the most up-to-date *trail* map.



1. **Ridge Trail** – Category B – Begins at a retention pond on Madeline Bennett Drive near the north east corner of the school, proceeds south and west, crosses the Gateway *Trail*, and ends at the intersection with School Loop at *trail* point 16. This *trail* is entirely on school property.

2. **School Loop** – Category B – Begins and ends at the kiosk in the school's upper parking lot at *trail* point 2. It makes a loop, intersecting with the Link *Trail* and the Ridge *Trail* at *trail* points 3a, 3b, and 3c. This *trail* is entirely on school property.

3. **Gateway Trail** – Mixed Category A/B – Designated as a *Woods Road*, this *trail* begins at the emergency fence at the top of the MMS Upper Parking lot behind the school and heads generally west, traversing almost the entire length of the property, ending at the intersection with South Grater Rd., *trail* point 19. (The Gateway *Trail* bisects the Grater Woods Town Forest and was purposely built to support Emergency Vehicles.) This is the main emergency access *trail* for the property, although the western portion of the *trail*, from the point where it goes up Gateway Hill (formerly referred to as Suicide Hill) to the end at South Grater Rd, will not accommodate emergency vehicles.
    a. Section 1 – Category B – Starts at the emergency access fence in the MMS Upper Parking lot and continues to Wildlife Opening 1 (*trail* point 11). A large portion of this section is on School owned property.
    b. Section 2 – Category A – Starts at Wildlife Opening 1 (*trail* point 11) and ends on South Grater Rd at the Merrimack town line. Sections of this *trail* will require gates and development plans for wetlands avoidance.
4. **Brick Yard Trail** – Category B – Begins at *trail* point 8 on the Link *Trail*, proceeds northwest, and ends at trail point 11b of Wildlife Opening #1. This *trail* runs relatively parallel to the Gateway *Trail* and provides access to a view of the lower Beaver Pond.

5. **Pond View** – Category B - Accessible from Wildlife Opening #2. The *trail* terminates at the waters edge of the Middle Beaver pond.

6. **Red Maple Trail** – Categories A and B – There are three distinct sections of this *trail*:
    a. Section 1 – Category A - Begins at trail point 11 on the Gateway Trail and proceeds north toward Conservation Drive.
    b. Section 2 – Category B - Turns west near Conservation Drive, generally following the northern property boundary.
    c. Section 3 – Category B - Makes a hard left turn near the Trowbridge area to head south, ending at the intersection with the Gateway Trail near the bottom of Gateway Hill at trail point 15.

7. **Drilled Rock Trail** - Category B - Begins at the Red Maple *Trail* just north west of Wildlife Opening #1, it passes by the "Drilled Rock" and ends back on the Red Maple *Trail* just north of the large beaver dam near Beebe Lane cul-de-sac. This category B *trail* gives an alternative to the Red Maple *Trail* that passes through the open areas around the large drilled rock and has a great view of the beaver pond and a large wildlife opening.

8. **Salamander** - Category C - Begins at Grater Road near the Amherst/Merrimack line and winds through the woods with a series of tight turns, ending at the top of Gateway hill across from Millipede *trail*. This category C *trail* was created for *trail*

running, hiking, mountain biking, snow shoeing and XC skiing.

9. **Millipede Trail** - Category C - Begins and ends on the western most part of the Gateway *trail* (by Grater Road). Millipede winds through the woods with multiple turns and at its eastern most point borders private property. This category C *trail* was created for *trail* running, hiking, mountain biking, snowshoeing and XC skiing.

10. **Link Trail** - Category B - Begins at the western most point of School Loop, crosses Gateway and ends at the western most point of Ridge *Trail*. The *trail* contains a single bridge and a steep slope rising to Gateway. The trial then bisects a beaver pond and *vernal pool* before connecting to Ridge *Trail*.

Trail Guidelines:

All users are strongly encouraged to remain on the marked *trails* as shown on the "Grater Woods Forest" in Appendix A. They must avoid wetland areas and any areas designated as environmentally sensitive. Leaving the marked *trails* should not be done without a map, compass and the necessary navigational skills. Users should not rely on cell phones, as they do not work in most areas of Grater Woods. Only motorized vehicles, previously designated for maintenance or emergency use by the proper Town and/or School Officials, are permitted to leave marked *trails*. Emergency access by police and fire units are very limited due to the small number of vehicle access points and poor interior *trails*.

Trail Design, Future Trail Creation and Trail Modifications:

The design concept of all new *trails* must be presented to the *MCC* prior to creation. It is the responsibility of the *MCC* to review new trial requests and ensure that all proposed design elements fit within the principles and guidelines, as presented by the Best Stewardship Practices for Forestry prior to approving the new plans.

Trails should be created with many factors taken into consideration including but not limited to the following:

- *BMP*s
- Local, State and Federal regulations and associated governing documentation
- Loop creation around the open space
- Accessibility to new and/or existing parking areas
- Sustainability of the *trail* being added
- User demand / suggestions from the public
- Multi-user designation
- Access to new and interesting areas within Grater Woods
- *Trail* upkeep
- Impact to abutters
- Map and Stewardship plan rework

Section 6 Educational Opportunities

Grater Woods abuts the Merrimack Middle School, providing a unique educational opportunity for Merrimack's students and residents. This section describes the past, present, and potential future educational activities on Grater Woods.

Past:

Thanks to cooperation between the *MCC*, *MSD* staff, and local volunteers, the MMS students and town residents have benefitted from several opportunities on Grater Woods. The MMS Upper Parking Lot and associated lots have proven their worth as an excellent access point. Many *MSD & MCC* sponsored activities* have used the MMS property to launch successful educational and monetarily effective projects. The majority of these endeavors are executed outside of normal school hours and have minimal impact on MMS activities.

Some of these hosted activities include:

- Creation of the School and Grater Woods *Trails*
- *MSD* and *MCC* Timber Harvests
- *Vernal Pool* Party
- Winter Walk to Amherst
- Logs to Lumber
- Creation of the Outdoor Education Center
- MMS Cross Country home meets

The following is a brief summary of some of the activities that have contributed to the educational value of Grater Woods.

- **The Ridge Trail** – In 2005 and 2006, the Merrimack Outdoors Club, coordinated by Rick Glatz, created the Ridge *Trail*. With assistance from the Project Gateway students, parents and other volunteers, the Ridge *Trail* became the first *trail* on what would become Grater Woods to be used extensively by Middle School students. The Merrimack Outdoors Club evolved into the *FGW*.

- **The Middle School Trail Project -** In 2007, two Merrimack Middle School science teachers, Ann LaCroix and Chris Nawrocki, contacted Andy Powell, Chairman of the *MCC*. They were looking for assistance in improving the old logging roads on the school land so they could be used as walking *trails* for the students. Andy and the *MCC* worked with Ann and Chris to lay out the *trails* (some of which cross onto town-owned land) and planned the improvements. Ann and Chris submitted a grant request to cover construction costs, and the *MCC* guaranteed $6,000 of matching funds. The grant was awarded, and the two groups – *MCC* and school staff – got to work doing what each does best.

  The *MCC* selected the contractor, trained and supervised him in building the

trails, helped coordinate volunteers, provided materials for several bridges, and provided a kiosk at the trailhead. The town PWD, using *MCC* funds, prepared *trail* signs. Ann and Chris tackled the educational end of the project, working with other school staff to develop the programs that would take advantage of this safe, well-constructed *trail* system right outside the school. The two groups, with the help of the *FGW*, worked together to do the final grading, seeding, and spreading of mulch. The *trail* is now used almost daily by students.

- **The Grater Woods Educational Center –** Ann LaCroix and Chris Nawrocki were also great advocates for establishing an outdoor education area, as promoted by the Project Learning Tree ® organization. In June, 2008, Ann and Chris sent a questionnaire to school staff to determine what sort of structure should be built. As a result of the responses, *MCC* and school representatives examined several locations and designs, and an open-air education center was built in the fall of 2009. The best location happened to be on town land, overlooking a beaver meadow just behind the school, creating another opportunity for cooperation between the *MCC* and the school. The *MCC* agreed to develop and maintain the Grater Woods Education Center at no cost to the school district. John Diggins of the *MCC* and Gage Perry of the *FGW* attended a Project Learning Tree ® seminar, and then created the plans for the GWOEC. They, along with Rose Robertson Smith, the Chairman of the School Board, submitted the plans to the *MCC* for approval.

  Once the plans were approved, volunteers from the *MCC* and *FGW* prepared the land and cleared, leveled and mulched a pathway from the backdoor of the school into the Education Center. The lumber for seating for 80 students was created by milling the hemlock cut and processed during the 2008 harvest. With donations from many volunteers and Keith Howe of Howe Septic (who donated time and labor to create the center and continues to provide wood chips yearly), the GWOEC was created. The *MCC* and the *FGW* have worked with the teachers on several programs involving wildlife and other natural resources. The GWOEC is primarily used by Merrimack students, but it will also be used for *MCC* programs.

  Future plans include an environmental *trail* around the beaver meadow and upgrades to the teaching area. A viewing deck has been approved as an Eagle Scout project in the Summer of 2011 and will be west of the seating area.

  The GWOEC should be maintained and expanded in its use for workshops and seminars for local citizens. The Environmental *Trail* should be developed as time and resources permit. The Grater Woods Stewards should always be available to assist the teachers as this close location of a town forest to a school provides an opportunity that many other towns would like to obtain.

- **Logs to Lumber –** During the 2008 harvest 40 12-foot long hemlock logs were cut and moved from Forest Stand G to the wildlife opening called Gateway

Junction. These logs were milled into 3,500 board feet of lumber. The 2" thick boards have been used to provide seating for 70 students in the Education Center and are stockpiled for other bridge and similar projects. In September, 2009, the *MCC* worked with school staff to turn a forestry project into an opportunity for learning in the Logs to Lumber program. Science teachers walked every science class up to the logging site to observe the work of the portable saw mill. Students gained an appreciation for the importance of properly managing our forest resources. The wood from the project was used for the benches at the GWOEC, for signposts on Grater Woods *trails*, for PWD projects, for Eagle Scout projects, and for bridges and benches.

- **Poster contest and mural** – To raise student's awareness of the wildlife on Grater Woods, the school held a poster contest. Edgar the Moose became the symbol of Grater Woods wildlife, and he is featured in a mural in the school.

Students are not the only beneficiaries of educational programs at Grater Woods. In May, 2009, the *MCC* organized a walk at Grater Woods with ecologist Jeff Littleton, of Moosewood Ecological LLC, to explain the importance of *vernal pools* to both adults and students. The following winter, Jeff conducted a walk with students to help them learn how to identify animal activity.

Present:

The *trails* and forest of Grater Woods are an integral part of the curriculum at Merrimack Middle School. The students are maintaining *transects* to collect information on wildlife while learning about the outdoors.

The MMS teachers, following curriculum framework to meet educational benchmarks for content, use Grater Woods in a number of educational areas to bring context to textbooks. Art classes use materials from the property to create projects. English classes create writings on topics found in the woods, whether it be a poem about spring to an essay about animals on the property. Math classes use the property for measurement exercises and geometry. Science curriculum includes the multitude of life science examples on the property and also the physical science examples that can be found in nature on the property. Physical Education is also held on the *trails* as an alternative to activity through sports. Foreign Language is taught to teach vocabulary about what is seen on the property. Meteorology lessons can be accomplished on the property such as the impact of extreme weather on the forest and its inhabitants as well as the life cycle of a water table affected by seasonal change. Teaching teams collaborate on topics so students can accomplish multiple goals on a specific subject matter in all areas of their educational coursework.

In addition to the school day, students involved in clubs and sports, such as the Cross Country team, use the property after school for their activities. The Middle School hall has a mural that is added to when a new creature is witnessed by the students. The

Middle School continues to use content from Project Learning Tree ® that includes books, posters and pamphlets to continually refresh educational content related to curriculum as it relates to the property.

In addition to the school benefits, community education is occurring. For example, the New England Mountain Bike Association hosts mountain bike riding classes on Grater Woods, to familiarize riders with how to handle the varied terrain.

Future:

The Middle School has the opportunity to utilize the property in new ways going forward as the coursework and teaching teams identify areas of commonality that can be achieved on the property. Guest experts can be used to offer new information and hands-on opportunities beyond the already established Hawk Expert visits that students have enjoyed to date. Beyond the Middle School, Elementary through High School levels can see educational benefit from enhancing their curricula using the property. For example, the high school science class can study *vernal pools* using living examples. These are simply a few ideas of the educational possibilities for students of the Merrimack School District.

Future community education is anticipated as the community learns more about the property, its features and the activities that are supported on it.

Recommendations:

The *Stewardship Team* should:

- Continue to assist school staff with a variety of educational programs. Assistance might include leading tours in the forest, running workshops, constructing educational *trails*, maintaining existing *trails*, and providing other assistance at the request of school staff.
- Continue to explore possibilities for the development of the GWOEC and education *trail* with the cooperation of the School Board.
- Continue to maintain a close working relationship with school administration and staff. Enjoying abutting town and school properties has many benefits, but the *Stewardship Team* will have to strike the right balance between the desires of users of the town property and the safety and security of students.

Section 7 Access and Parking

There are nine (9) potential access points for the Grater Woods property; three (3) being Primary and the remaining six (6) being Secondary. For purposes of defining the access points, they are either ***Primary*** or ***Secondary.***

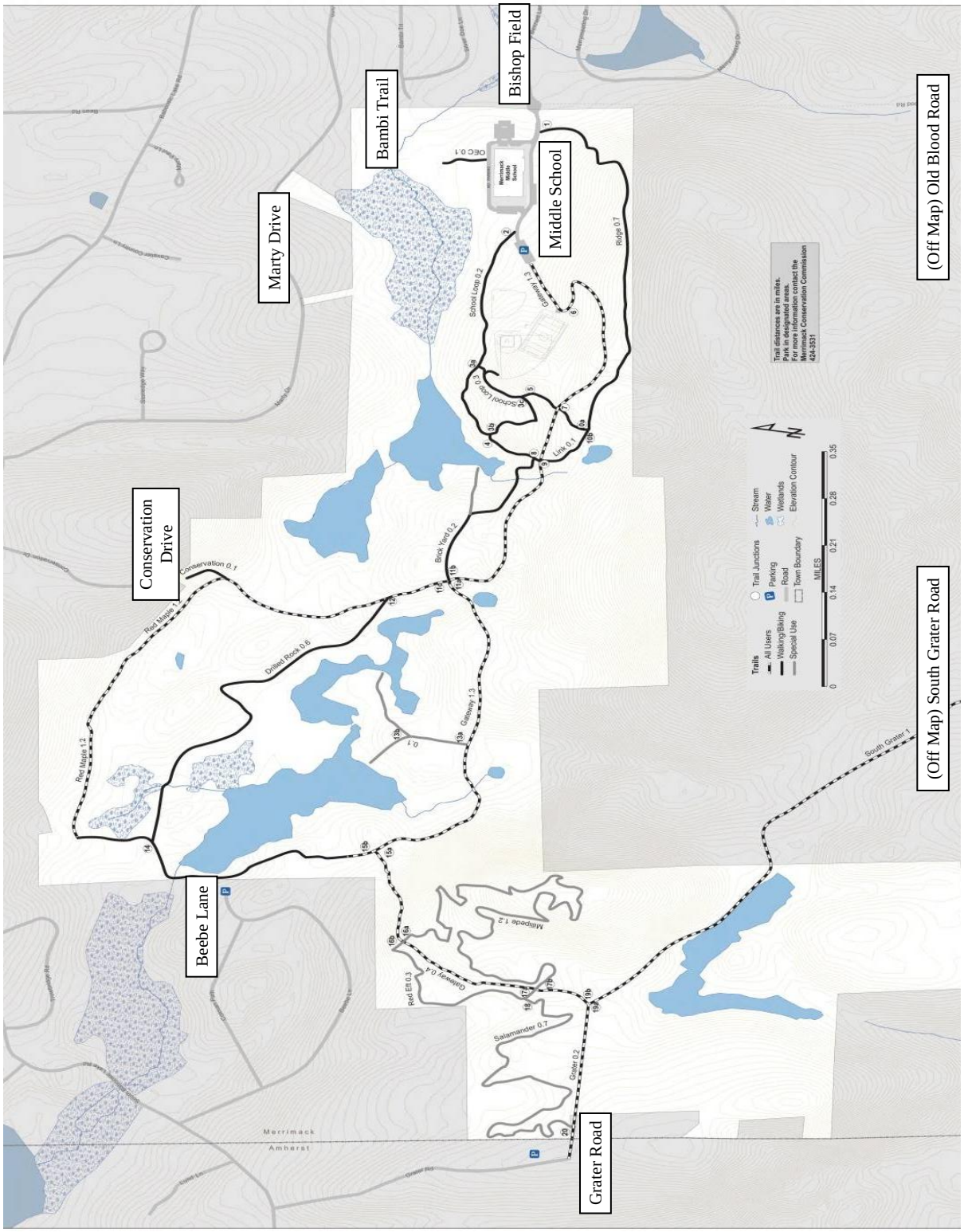
Primary means an access point that has easy access to the *trails*, will have kiosks and available parking near the *trail* heads.

Secondary means an access point that will be considered for future improvements. Local users may use the access point but the entry points may not provide direct access into the *trail* system, may not have adequate parking and will not have kiosks.

In evaluating the various access areas as Primary and Secondary, several points were considered:

1. How will the access point impact adjacent private and public properties?
2. Is the approach to the access point close to or easily accessible from a main road?
3. Does the access point provide ready access to the *trail* system?
4. Is the access point currently being used to access the property?
5. Are there unique benefits or challenges associated with the location?

The location of each access point is identified in the following map; detailed maps are provided with each access description. Note that *trail* routes shown on this map are for reference only. Refer to Appendix A or www.merrimackoutdoors.org for the current *trail* map.

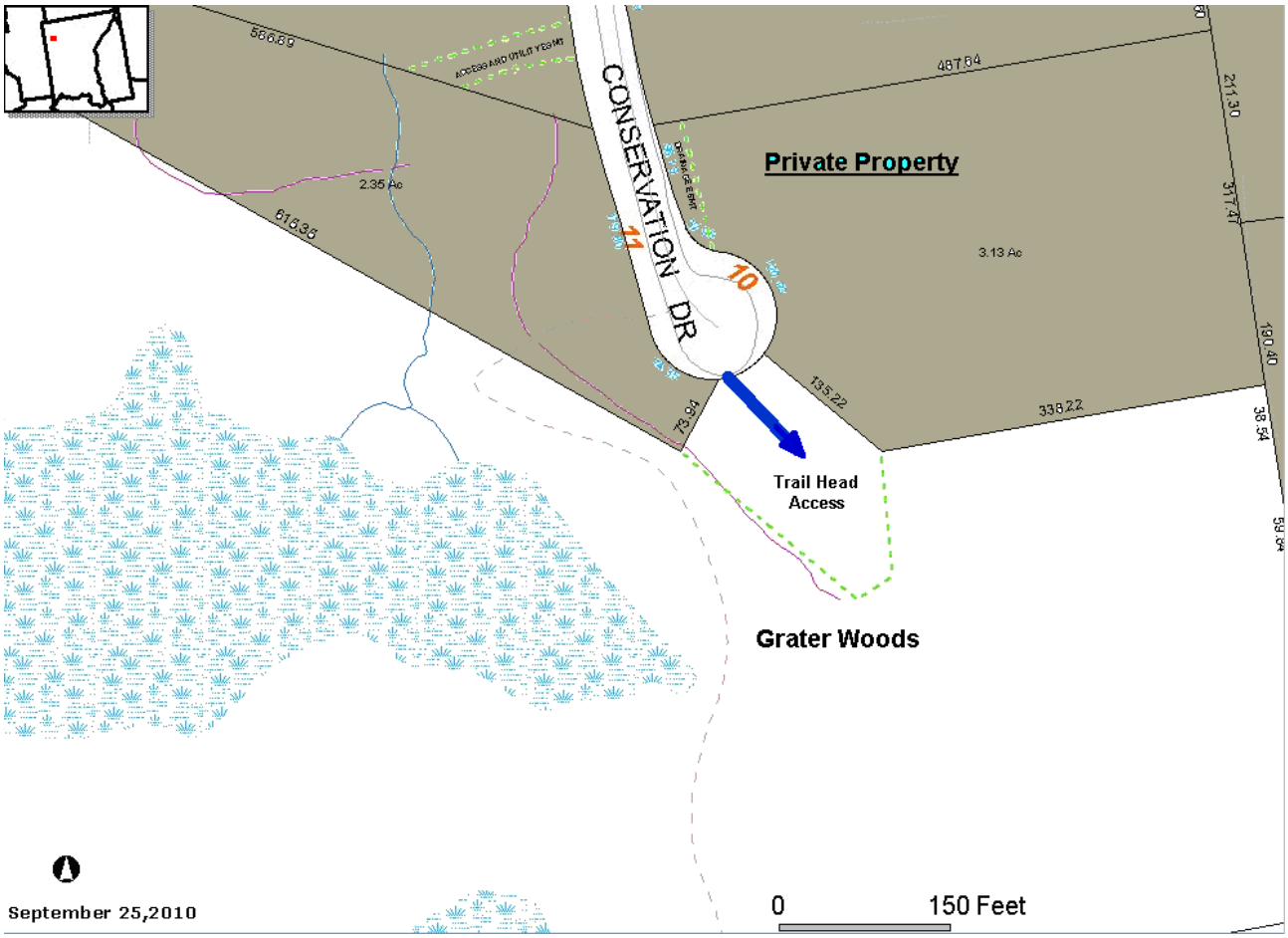


Access Points

Conservation Drive (Primary Access):

1. Close to Baboosic Lake road for easy access of potential users and emergency equipment if required.
2. Access for non-motorized and motorized users and, maintenance equipment.
3. Central location, available room for parking and immediate access by emergency vehicles and equipment.
4. Plans to address the steep slope and wet terrain are in process.

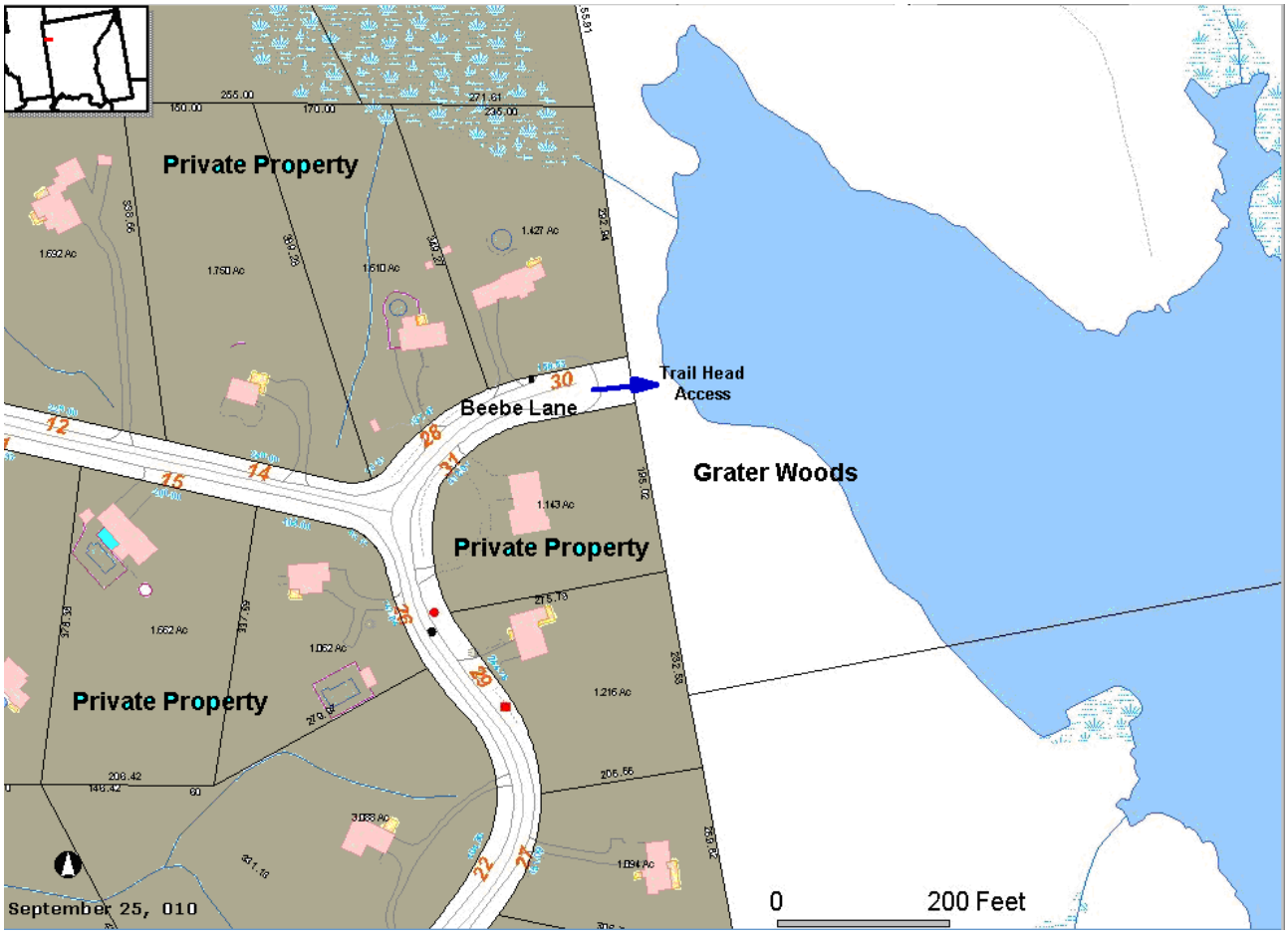
Recommendations: Conservation Drive access is best suited for immediate development for multiple users, inclusive of motorized users.



Beebe Lane (Primary Access):

1. Ready access to marked walking and mountain bike *trails*.
2. Currently the *trail* access is for pedestrian and mountain bike, and is not conducive to motorized access because of wetlands, limitation on parking and extreme sloping terrain.
3. Available parking on a small cul-de-sac.
4. There is close proximity to main road, South Baboosic Lake Road
5. The *trail*, North of the entrance, will require the building of bridges to keep users from further damaging wet lands.
6. Hilly access, leaving the parking area, needs to be reviewed and enhanced to protect from further erosion by increased usage.
7. Limited property as abutter's property lines may encroach upon any potential *trail* plan and needs to be reviewed in further detail.

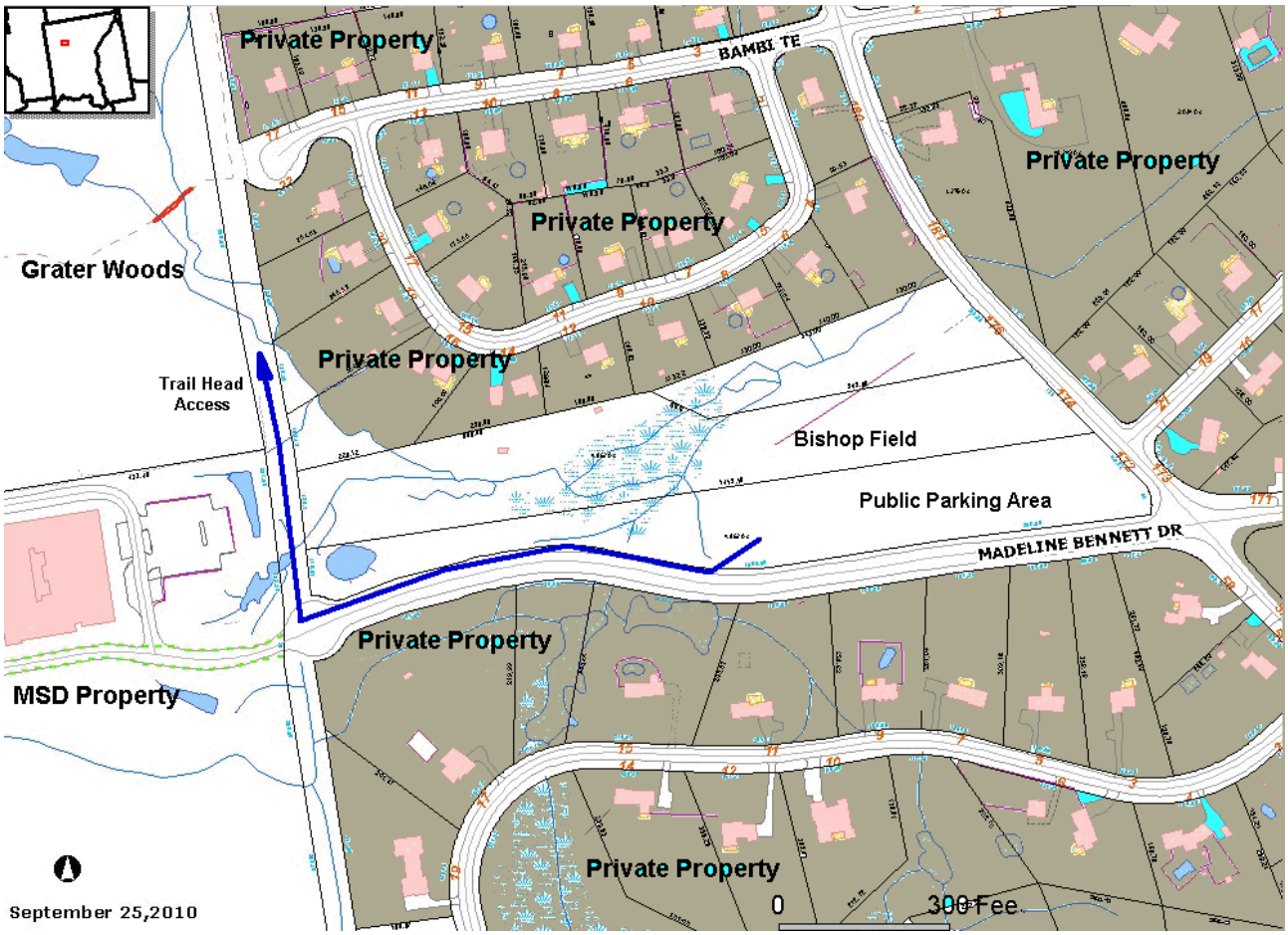
Recommendations: Beebe Lane cul-de-sac offers a prime access site and should be further developed with relatively high priority. However it should be limited to pedestrian and non-motorized activities.



Madeline Bennett Way / Bishop Field (Primary Access):

1. This parking area provides an additional access point for the Outdoor Education Center and Grater Woods *Trail* System.
2. The parking area is large and actively maintained by the town all year.
3. The parking area is equipped with temporary restroom facilities from Spring through late Fall.

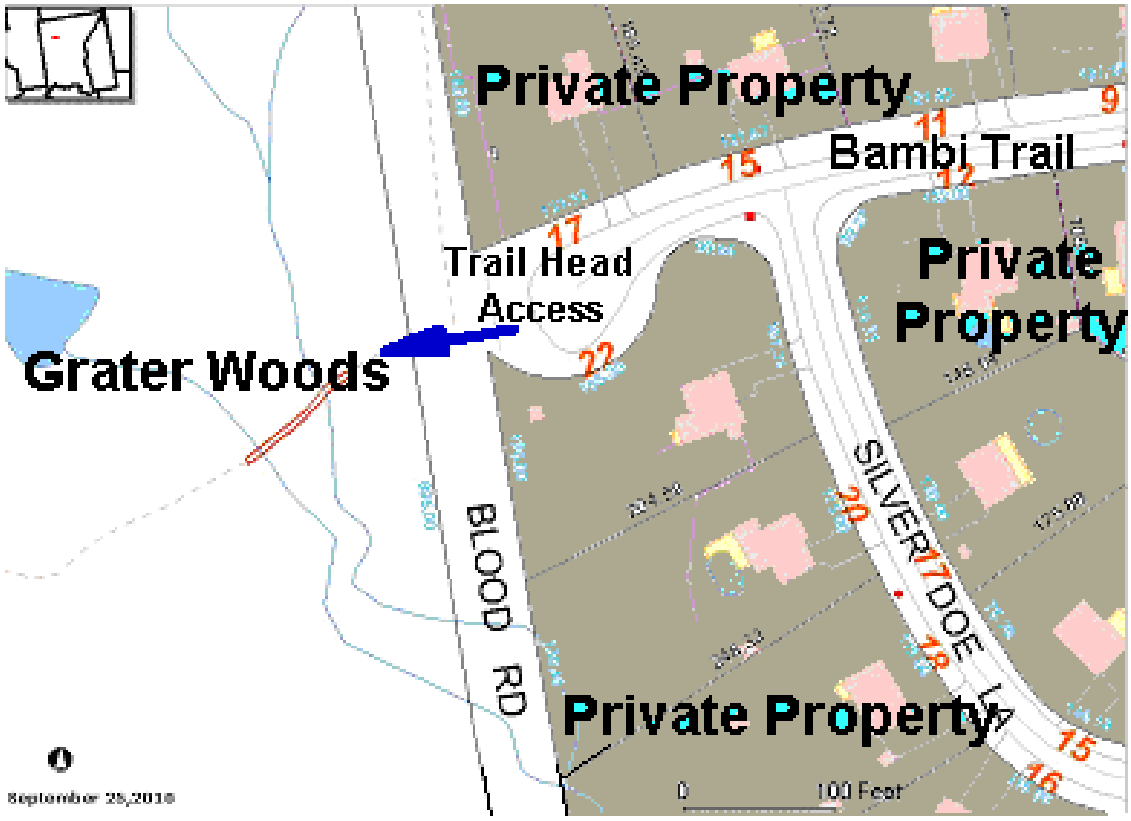
Recommendations: Create an access to the Outdoor Education Center avoiding *MSD* property. Develop a new *trail* spur leading from the cul-de-sac on Madeline Bennett Way north on Old Blood Road.



Bambi Trail – (Secondary Access):

1. Minimal parking on the cul-de-sac for 3 to 5 vehicles and in a residential neighborhood.
2. Accessible from Baboosic Lake Road requiring minimal signage for parking.
3. Although the *trail* system can be accessed from this point, the current *trail* traverses Old Blood Road (Class 6 Highway) then leads to the GWOEC and terminates behind Merrimack Middle School.
4. Primary current usage is students walking to school.
5. Close proximity to several residential neighborhoods providing walking access to the GWOEC and MMS.
6. Existing *trails* are extremely wet and development of this access point will be difficult to minimize wetlands impact.

Recommendations: This access point should be improved with footbridges and other *trail* improvements in order to minimize further wetland impact.

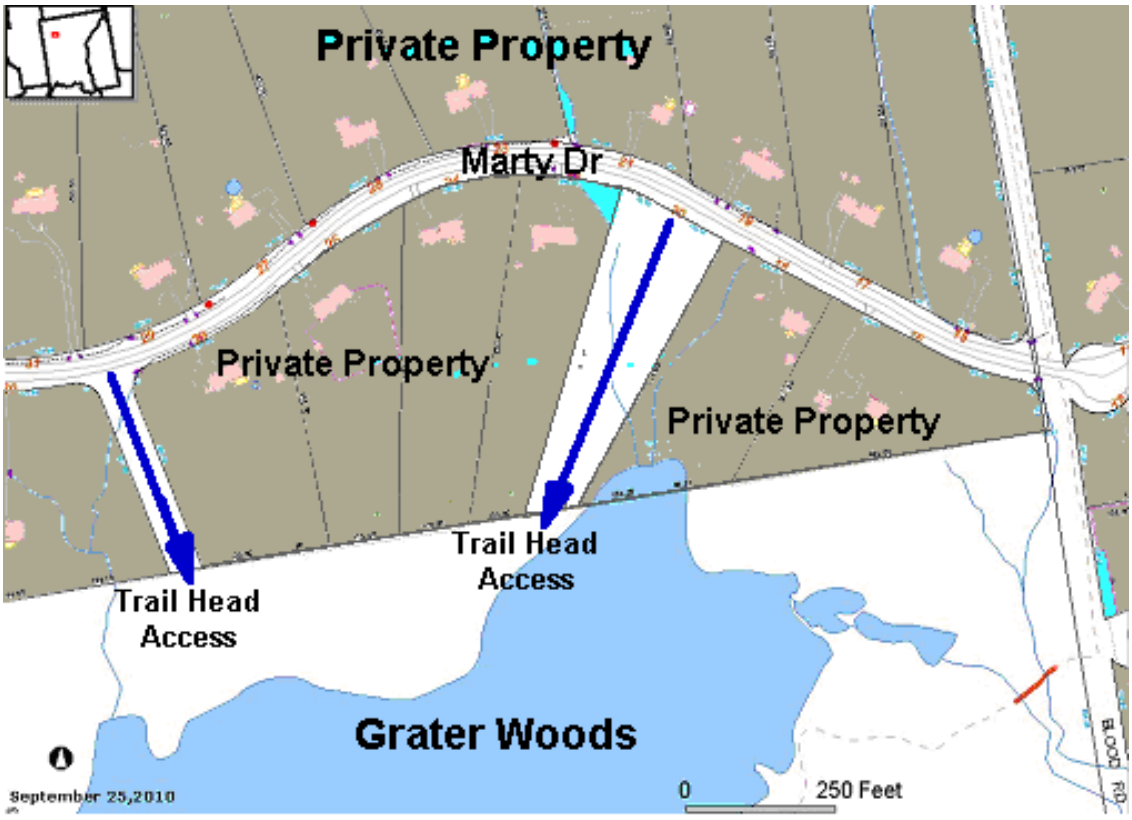


Marty Drive (Secondary Access):

Three potential access points (the intersection with Old Blood Rd and two woods entrances) exist off Marty Drive:

1. There is no parking access and the area is in the middle of a residential neighborhood.
2. Seasonally, an unknown number of students walk to school using a path leading in from Marty Drive.
3. All three access points are extremely wet and/or steep and it would be costly to create viable trails at any of these points.

Recommendations: In the future, research how many students use this access point and whether improving the *trail* for their safety and comfort would be practical.



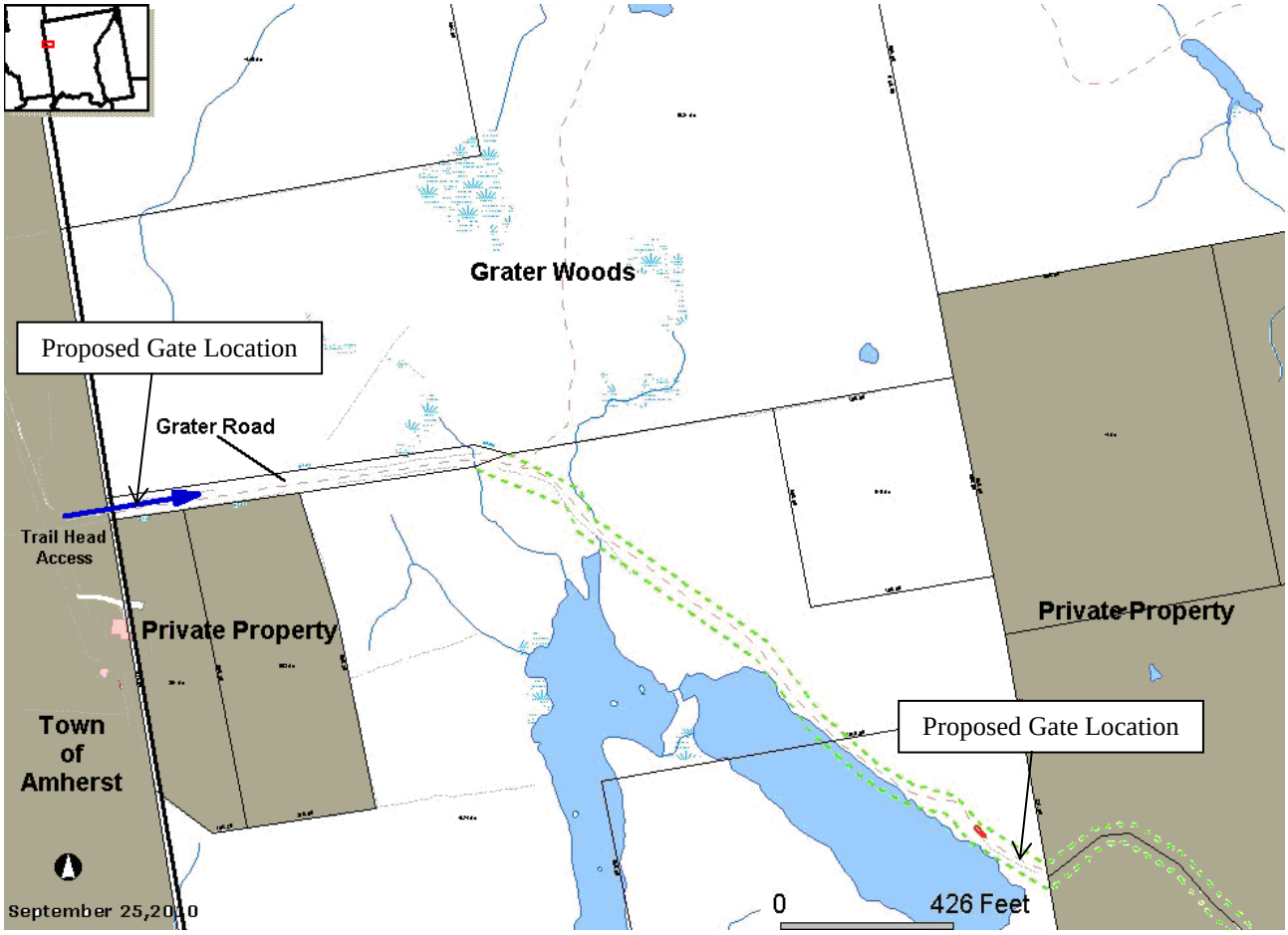
Grater Road (Secondary Access - via South Baboosic Lake Road in Amherst):

This end of South Grater Road originates in and traverses Amherst for roughly 1 mile before it enters Merrimack (Grater Woods) and continues southeast across Grater Woods. It is classified as a Class VI road In both towns. Once the road enters Merrimack it winds across Grater Woods, in a southeasterly direction, towards Wire Road. South Grater Road contains numerous large wet/muddy areas, shows erosion, closely abuts several large wetlands and, for approximately ¼ mile, is flooded by a nearby beaver pond seasonally and during heavy rain events. While flooded, this section of the road must be bypassed as traversing it violates wetlands restrictions. An upgrading will be a costly operation in order to avoid wetland impacts. Since it is a Class VI road it cannot be improved without a change in status by the Town Council or as part of a forestry harvesting project.

1. Impact to local residents is minimal as the road is classified as a Class VI road and only a single parcel is currently using it as their driveway. Amherst Conservation Commission has a small parking area accessible except in the winter.
2. Main road access is from South Baboosic Road a short distance over the town line in Amherst.

Recommendations:

1. The parking area should be identified on the map.
2. This access point must be limited to use by non-motorized uses as the Town of Amherst does not permit it on their properties.
3. Coordination with the Town of Amherst is required to cross their land and use their facilities.
4. The road within Grater Woods should be improved to minimize wetland impacts. A determination of the best means to achieve the improvements will require either Town Council reclassification of the road, a forestry project, or both.
5. South Grater Road should have two gates installed at the Merrimack boundaries and should be maintained for emergency access.

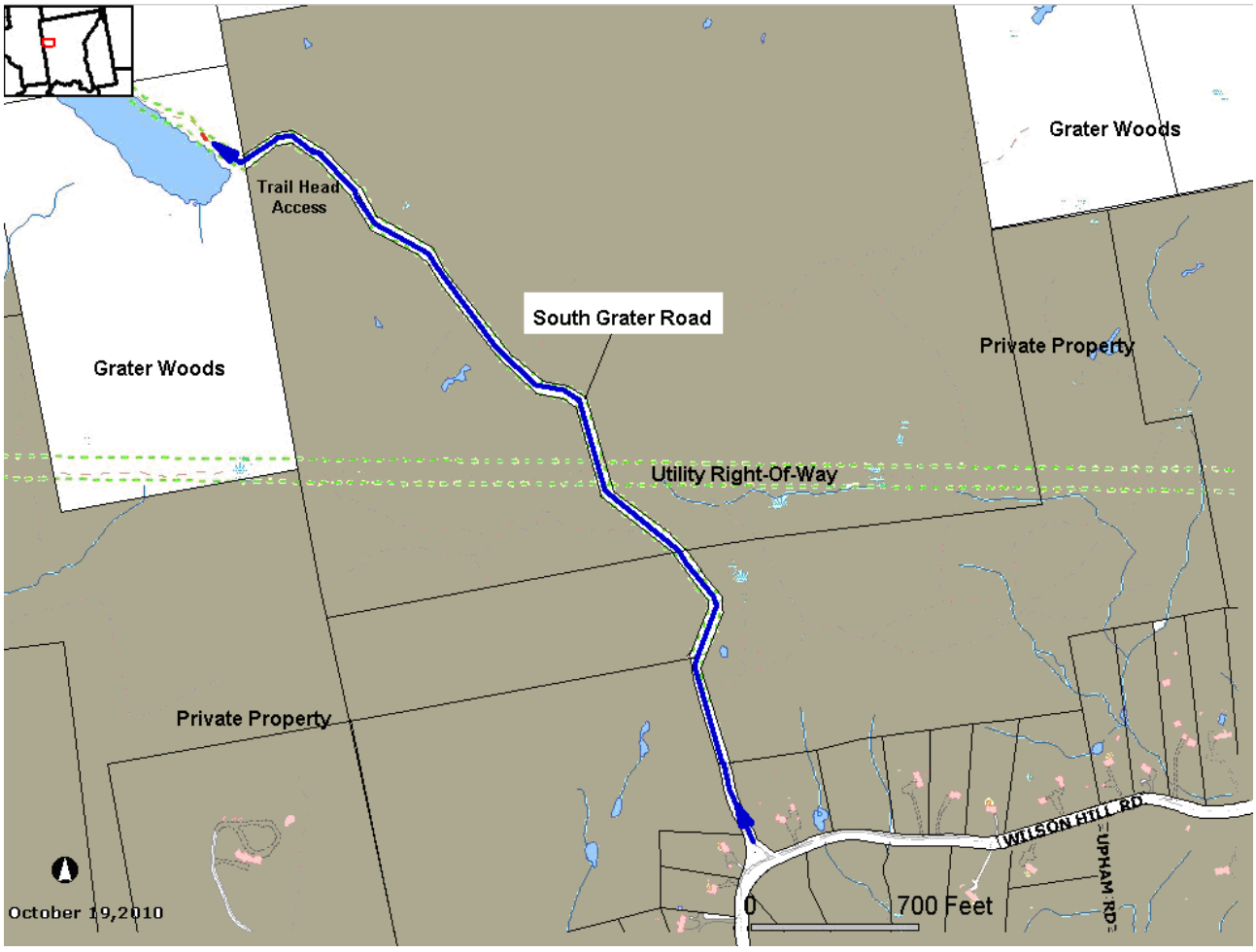

Grater Woods
Proposed Gate Location
Grater Road
Trail Head Access
Private Property
Town of Amherst
Private Property
Proposed Gate Location
September 25,2010
0
426 Feet

South Grater Road (Secondary Access - via Wilson Hill Road):

This portion of Grater Road runs from Wilson Hill Road through an undeveloped area in a northwesterly direction until it arrives at the eastern boundary of Grater Woods. Access from Wilson Hill Road follows the old road bed that has been used by loggers and motorized vehicles without any maintenance as it is a Class VI road.

1. Although there are apparent benefits accessing Grater Woods from Wilson Hill Road the challenges are numerous; the terrain is steep, there are numerous wetland impacts, and the road is susceptible to damage by logging trucks accessing abutting private lands. As noted in the prior section any corrective actions and maintenance activities will require careful consideration as this is a Class VI Road.
2. Ready access is not possible for most vehicles due to the road conditions.

Recommendations: Access from this point is not viable at this time but should be considered for future improvements in order to achieve better fire protection to this area.

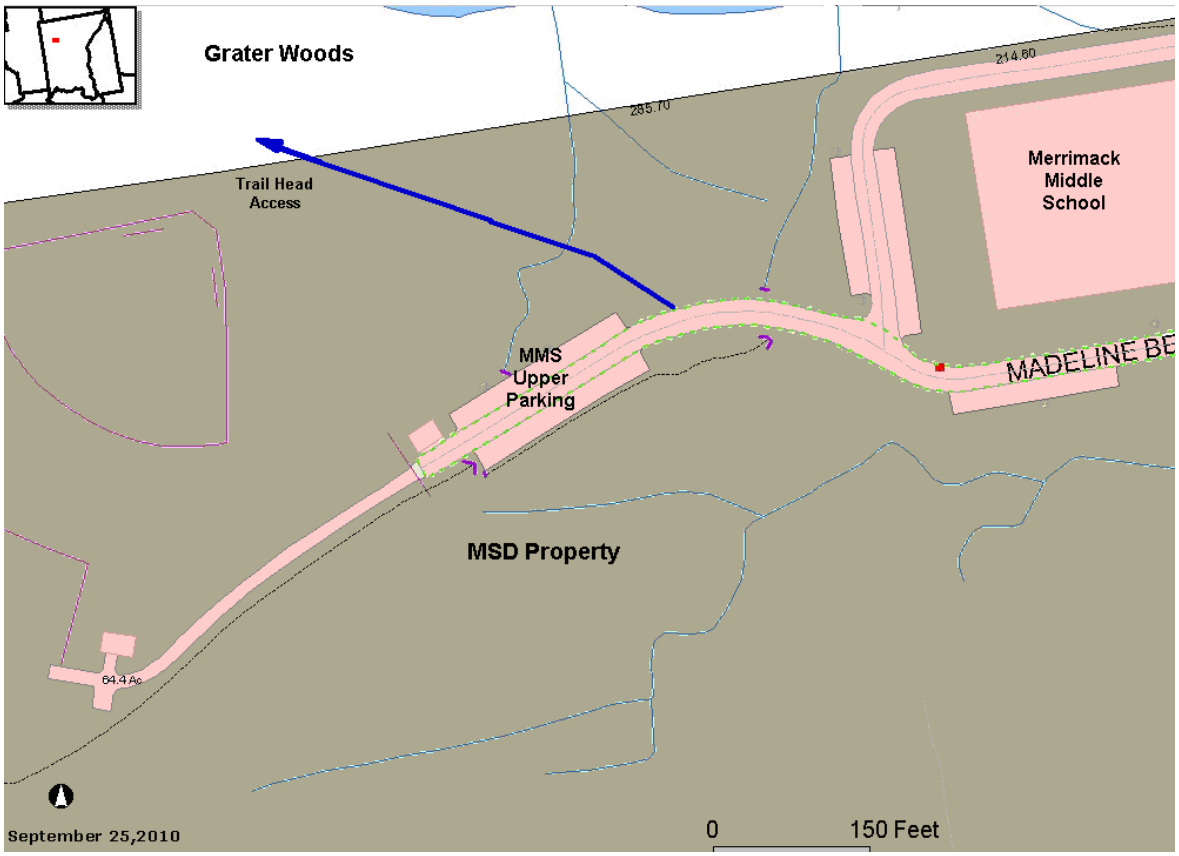


MMS Upper Parking Lot (Secondary Access):

The MMS property is heavily used during school hours. During regular *MSD* hours and events, public accessibility and usage is governed by the Memo of Understanding between the Town of Merrimack and *MSD*. Outside of school hours, the parking areas remain accessible and provide a well-lit, patrolled parking area.

1. The MMS Upper Parking Lot is easily accessible from Baboosic Lake Road
2. The MMS Upper Parking Lot provides a superior access point to the Grater Woods *trails* for recreational, educational, maintenance and emergency purposes.
3. This area is designated as the Emergency Access Point for Fire and Rescue personnel as it leads to the Gateway *Trail*.

Recommendations: Restrictions on use of this access point and *MSD* parking areas are determined by the Merrimack School District in accordance with District policies, procedures, and associated laws.



Private Access Points

Private access points and *trails* will not be identified on the property map. The Town is not responsible for maintenance or safety of these access points and *trails*.

Restrictions on private access points will be handled on a case-by-case basis. For example, if a law is being broken, such as a stonewall boundary marker being removed, legal authorities will be contacted.

Kiosks

Kiosks will be installed at Primary Access points. When three-sided kiosks are used, there is room for several notices as well as a map of the property.

Note: Information to be displayed in the kiosk at the school parking lot will be at the discretion of the School Board or their appointees.

Informational Kiosks may contain information on a wide variety of subjects, to include but not limited to:

- Information pertaining to hunting:
  - A hunting season/dates notice. This information is provided by the state Fish and Game Department and can be copied to be used as a notice. (See sample in Appendix B.)
  - A notice to visitors advising them of safety precautions, such as wearing orange. (See sample in Appendix B.)
  - A notice to hunters advising them that hunting is prohibited on portions of the property, and that school children, hikers, bikers, and other users might be present on the property.

- Information pertaining to motorized use:
  - A notice advising motorized users that certain *trails* are designated for motorized use and reminding them to respect *trail* designations.
  - A notice advising motorized users that use of motorized vehicles is restricted to Merrimack residents only.

- Information pertaining to:
  - Upcoming events
  - Wildlife notices
  - Seasonal restrictions regarding access and usage

Appendix A Purchasing History & Maps

Grater Woods is an assembly of multiple contiguous land parcels. The *MCC* recognized the potential for a large open space forest in 1999 by procuring vacant parcels centered about a 94 acre, town-owned, tax-deeded parcel. The *MCC* selected Grater Woods as the name for the open space, deriving the name from Grater Road, a historical roadway that abutted the original parcel. The initial forestry efforts within the Grater Woods were directed at resolving many of the issues caused by previous logging operations. Several of the private owners had logged the forests 30-40 years prior to acquisition by the town. As the abutting housing developments were constructed the residents starting using the old logging *trails* for walking, biking, skiing and riding motorized vehicles of several types. In 2002 the updated Town Master Plan recognized the importance of large contiguous open space parcels for wildlife and in particular the larger mammals. At the request of the *MCC*, the committee included in the revised Master Plan a call for the long-term goal of protecting a 500-acre open space parcel in the northwestern part of town. Over the next ten years the *MCC* acquired abutting parcels by outright purchase and by soliciting land donations. In 2009 approximately 50 acres of the original Grater Homestead land was purchased from members of the Grater family. Five of the Grater Woods parcels were purchased by the *MCC* Land Use Change Tax funds (*LUCT*). A developer donated a parcel as the land could not be used for housing and the developer of the Outlet Mall donated another parcel in order to meet NH Department of Environmental Services (*DES*) requirements for wetland mitigation. A conservation easement was given to the town as wetland mitigation for the construction of the Middle School.

Grater Woods is comprised of multiple parcels. The individual parcels are described below for informational purposes even though they are now considered as a single entity managed by the *MCC*.

The western parcel consists of 96.8 acres abutting the Amherst town line, Amherst conservation land and the historical Grater farm. Access to the parcel is from South Grater Road, a Class VI road located in both Merrimack and Amherst. It also abuts the back lot lines of several residences on Beebe Lane. This parcel was tax deeded to the town and formed the basis for the building of the large sized parcel designated as Grater Woods. The name was derived from the close proximity of the historical Grater farm and road. The town voters overwhelmingly passed a warrant article designating this parcel as the GRATER WOODS FOREST under RSA 31:110. The voters also approved *MCC* management with any funds from forestry operations to be placed in a special fund to be used to maintain the parcel (RSA 31:112-113).

The second parcel obtained consists of 94 acres purchased from the De Nicola estate in 2000 by the *MCC* with *LUCT* funds. It is located directly to the east of the first parcel. It is “land locked” as it does not have any frontage or access to public roads. The *MCC* was appointed to manage it by the Selectmen due to the use of *LUCT* funds.

The third parcel contains 74.4 acres and was donated in the spring 2005 by the Conservation Drive LLC. The *MCC* had unsuccessfully attempted to purchase a parcel of 93 acres owned by an out of state bank. When Conservation Drive LLC purchased the parcel from the bank, only a small portion was suitable for development so they donated the remainder to the town after cutting the timber. This parcel abuts the northern boundary lines of parcels A and B. It contains the northerly half of a large pond with an active blue heron rookery that originates on parcel A before flowing into Baboosic Lake. The Selectmen accepted the donation and designated the *MCC* to manage it as open space in conjunction with the other parcels known as Grater Woods.

The eastern 78.8-acre parcel was purchased from the Campo estate in December 2007 by the *MCC* with *LUCT* funds. This parcel abuts the Conservation Drive parcel to the west and is directly north of the Middle School parcel. It contains several large beaver ponds and drains to the east, through Mitchell Woods and then into Baboosic Brook. The Town Council, as a result of the use of *LUCT* funds, approved *MCC* management. A *trail* system in the southeastern corner continues on the school parcel and was built in cooperation with the school district in 2007. It appears to have been logged during development of the Marty Drive area in the 1980s.

In 2009, the town purchased an additional four parcels from the Grater family, in the southwest area of Grater Woods. The Grater Homestead is a 97-acre parcel of forestland containing 16+/- acres of wetlands. The whole wooded area now totals more than 400 acres of contiguous green space south of Baboosic Lake Road and its associated neighborhood developments. The entire block of forestland boasts a mixture of oak-dominated hardwood stands, old pasture land that has reverted to white pine, and shady hemlock stands on steeper slopes providing deer with wintering areas. The Homestead parcel adds another two beaver ponds to the assortment of ponds and wet meadows found throughout the rest of the property. With the exception of the northeastern corner of this parcel, most of this woodlot sits south of Grater Road on the western town line between Merrimack and Amherst.

All the corners for this property are in place, and many of the boundary lines themselves are old stone walls from the days when this forestland was cleared pasture. The property begins part-way down Grater Road, and has the road as the northern boundary for a while. When the road turns significantly and heads south, the boundary line continues along stone wall to the east. At the end of that wall, the boundary turns almost directly south and eventually rejoins Grater Road. South of Grater Road, the line picks up a stone wall and continues into a powerline ROW until it corners to the west. The line continues west through the powerline, through a wetland area (with no stone wall), and picks up stone wall on the western side of the poorly-drained area and continues to a corner of walls. The wall and boundary line head nearly due north along stone wall until a stone wall heads west off of the northerly wall. The boundary line follows the western wall. This westerly wall ends in a T, and the boundary line once again heads north up a stone wall. From this point, the boundary takes a number of jogs at right angles to each other, even bouncing across the Amherst town line for a short distance, until reaching

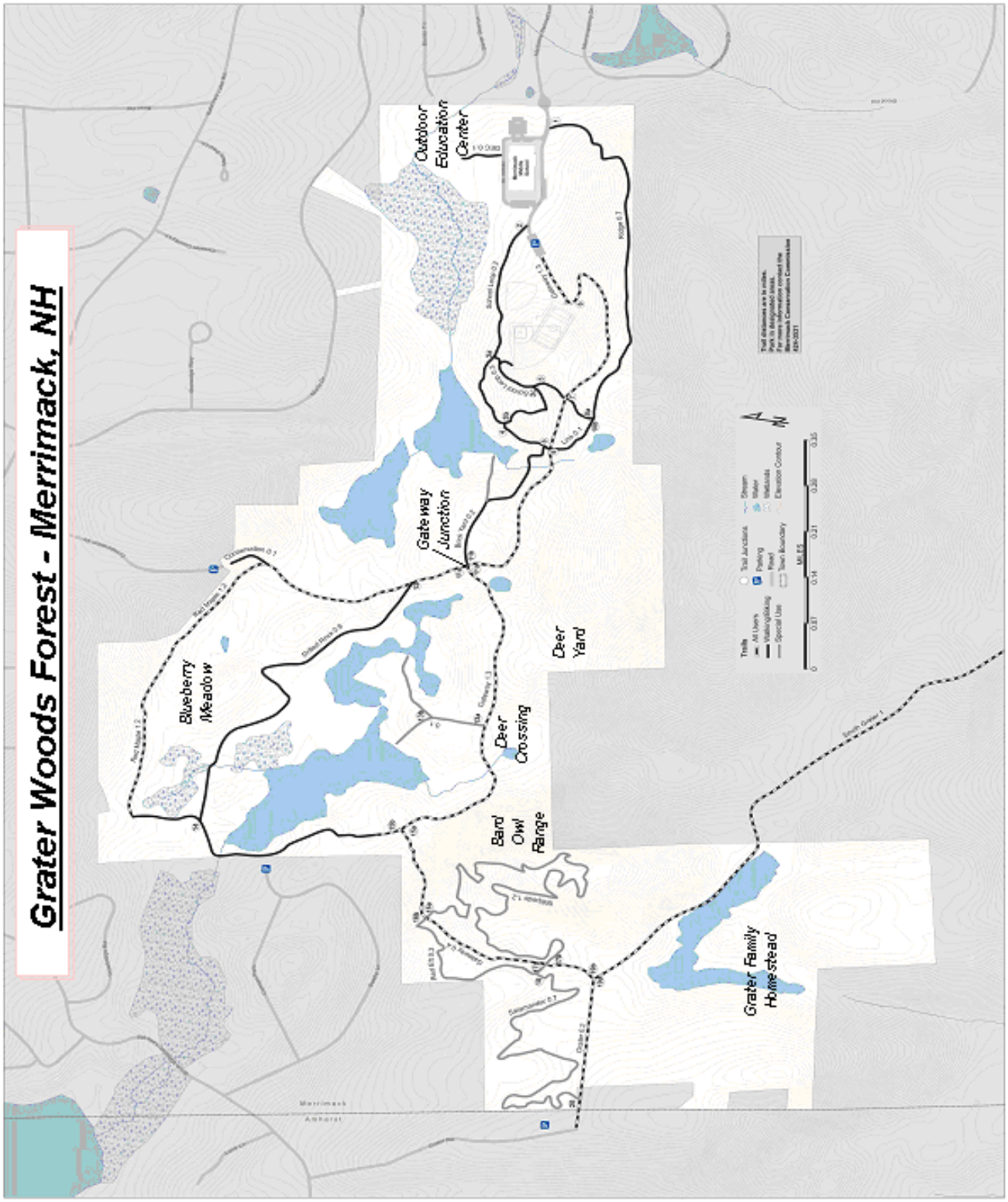
the beginning point on Grater Road. These boundary lines have not yet been blazed and painted, which should be done within a year, and then maintained every 10 years after that. Some boundary line signs have been installed near the lines, but these signs meander and are not a good indicator of where the line is precisely.

The School District owns an abutting parcel, 34 acres of which is managed by the *MCC* through a conservation easement. The School District-owned parcel is governed by school policies and easement restrictions.

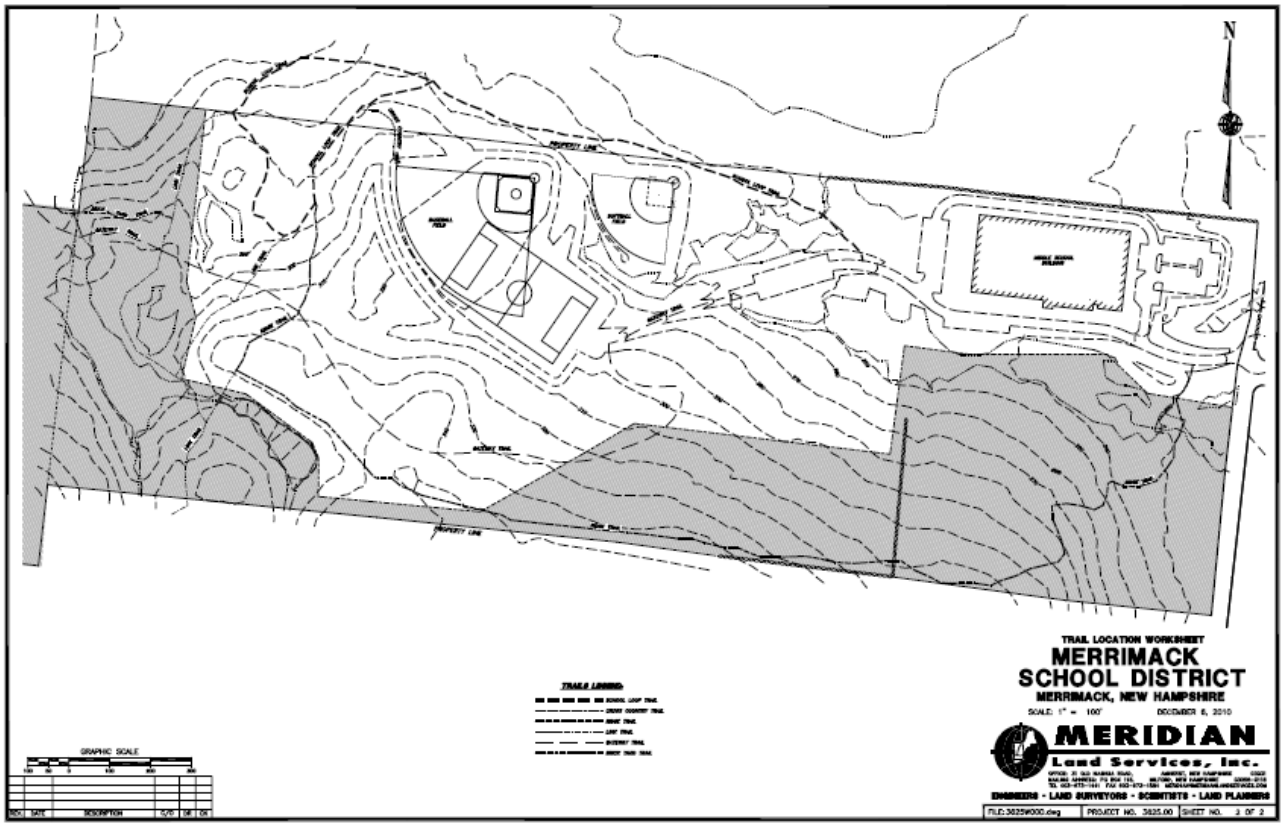
The maps portrayed in this section can be found on-line at www.merrimackoutdoors.org. These maps will be updated as necessary to capture the changes to Grater Woods, such as boundary modifications, *trail* development, wetland/*vernal pool* identification, wildlife habitats, etc. Always refer to the on-line map for the latest version.

Tax Deeded Parcels incorporated in Grater Woods:
5A-02
5A-05
5A-06
5A-09
5A-10
5A-63
5A-64
5B-10 (*MSD* Property – *MCC* manages the Conservation Easement only)
5B-11

Note: *Additional maps may be added to this appendix as they become available.*


Grater Woods Forest - Merrimack, NH
Outdoor Education Center
Gate way Junction
Deer Yard
Deer Crossing
Blueberry Meadow
Barn Owl Range
Grater Family Homestead
Merrimack
Amherst

School District Property Abutting Grater Woods



Appendix B Trail and Property Maintenance

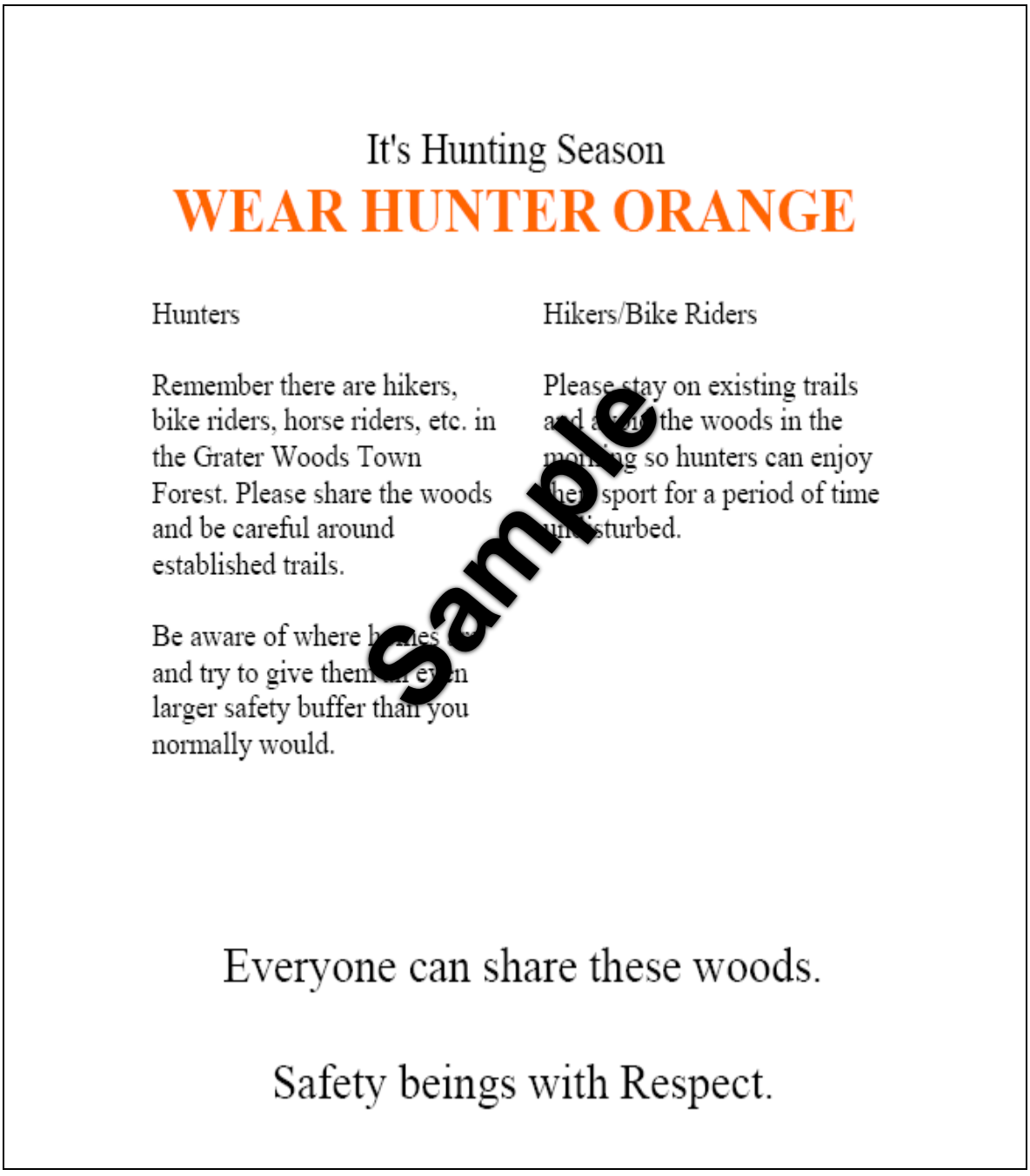
Maintenance of the Grater Woods *Trails* is critical to provide and sustain the experience *trail* users appreciate. All *trail* maintenance is performed following the most sustainable methods as descried by the *BMP*s. Maintenance activities are numerous and diverse. The following list is illustrative but not an exhaustive list the activities:

- Monitoring *trail* conditions, which includes *trail* inspections; monitoring the condition of gates, bridges, *trail* surfaces, and signage; hazard tree inspection; and removal of debris such as downed trees and unsecure rocks
- Scheduling of maintenance tasks
- Cutting and removal of downed trees on the *trail* surface
- Mowing of vegetation: shoulders, *trail* tread, parking lot entries
- Tree and shrub pruning
- *Trail* repair - fixing washouts and controlling erosion
- Maintaining bridge decking
- *Trail* drainage control
- *Trail* surface maintenance
- Evaluating existing wet areas and searching for possible seasonal *trail* closure or *trail* reroute.
- Checking and repairing kiosks, sign posts, informational signs, etc.
- Cleaning out ditches and culverts, replacing failing culverts
- Vegetation management – restoration/enhancement
- Posting *trail* closures
- Winter grooming
- Painting or replacing sign posts
- Maintaining boundary signs
- Coordination of volunteer efforts
- Posting of Seasonal Notices
- Closing / Re-Routing of *Trails* (temporarily or permanent)

The following is a "Suggested General Property Maintenance Task List" and is not considered exhaustive.

Description	Timing	Notes
Clean out culverts and drainage *swales*	Late Fall Early Spring	The culverts and swales should be clean enough to pass water quickly. This will have a considerable impact on the longevity of the road and length of Mud Season.
Mow road slopes	Mid Summer	Edges of roads need to be mowed to ensure strong growth for soil stability and minimize road encroachment
Mow wildlife openings	Early Summer	Mow after animals have stripped first growth. This allows for new growth by fall.
Re-Marking of the boundary and easement lines as needed.	Constant	Required for designation of town, school and private property boundaries for users and Police patrol
Weed and Chip Education Center Path	Late Summer	Prior to the start of School, the pathway and seating area of the GWOEC requires weeding and wood chips to allow for unfettered access by all students and school faculty.
Identification and Management of Invasive Species	Seasonal	Perform regular walk-through with trained personnel to identify and curtail the growth of non-native or invasive plants.

Kiosk Notices



NOTICE

Visitors to the Grater Woods Forest, who are not familiar with the trails, are expected to have a trail map and should refer to the map at all intersections.

The Grater Woods Forest is kept in as natural a state as possible. In a natural woods setting it is possible to be stung, bitten, cut or lost. Visitors should be prepared for these situations.

If you see a problem, please report it to the Merrimack Conservation Commission at:

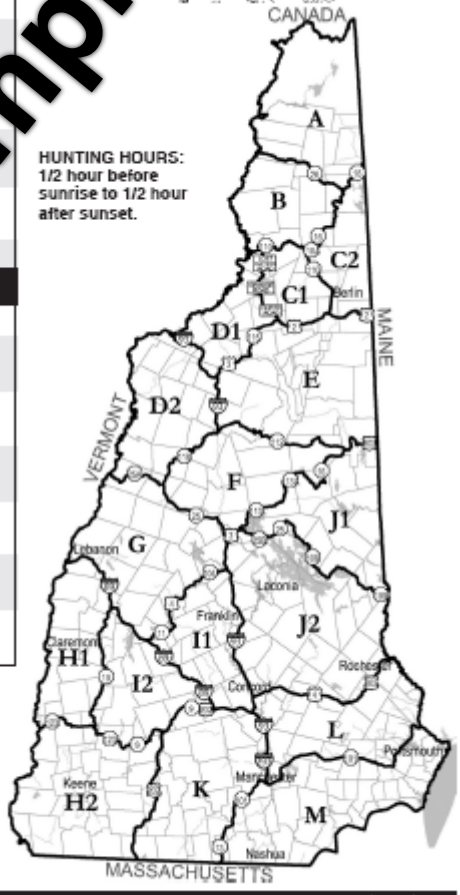
merrimackoutdoors@merrimacknh.gov

Please enjoy the forest responsibly.

2010 N.H. DEER SEASON

TYPE	INCLUSIVE DATES	WILDLIFE MGMT. UNITS
ARCHERY		
Antlered Only Any Deer	Sept. 15 – Sept. 30 Oct. 1 – **Dec. 8**	A
Antlered Only Any Deer	Sept. 15 – Sept. 30 Oct. 1 – Dec. 15	B-M
YOUTH WEEKEND**		
Any Deer	Oct. 23 – Oct. 24	STATEWIDE
MUZZLELOADER		
Antlered Only	Oct. 30 – Nov. 9	A, B, C¹, C², D¹, E, F, G, I¹, I² J¹
Any Deer Antlered Only	Oct. 30 ONLY Oct. 31 – Nov. 9	D², J²
Any Deer Antlered Only	Oct. 30 – Oct. 31 Nov. 1 – Nov. 9	K
Any Deer Antlered Only	Oct. 30 – Nov. 1 Nov. 2 – Nov. 9	H¹,
Any Deer Antlered Only	Oct. 30 – Nov. 5 Nov. 6 – Nov. 9	
Any Deer	Oct. 30 – Nov. 9	
FIREARM		
Antlered Only	Nov. 10 – **Nov. 28**	A
Antlered Only	Nov. 10 – Dec. 5	B, C¹, C², D¹, E, F, G, I¹, I², J¹
Any Deer Antlered Only	Nov. 10 ONLY Nov. 11 – Dec. 5	D², J²
Any Deer Antlered Only	Nov. 10 – Nov. 11 Nov. 12 – Dec. 5	K
Any Deer Antlered Only	Nov. 10 – Nov. 12 Nov. 13 – Dec. 5	H¹, H²
Any Deer Antlered Only	Nov. 10 – Nov. 16 Nov. 17 – Dec. 5	L
Any Deer Antlered Only	Nov. 10 – Nov. 19 Nov. 20 – Dec. 5	M

FIREARM OPENING DAY NOVEMBER 10, 2010



HUNTING HOURS: 1/2 hour before sunrise to 1/2 hour after sunset.

DEFINITIONS –

Antlered Deer: Deer with at least one antler three (3) inches long.
Antlerless Deer: A deer without antlers or with antlers less than 3 inches long.
Any Deer: All deer regardless of sex or age.

** Nonresident youth hunters may participate provided NH youth can hunt during youth deer hunts in their state of residence.

2011 Firearm Opening Day: Nov. 9, 2011

N.H. Fish and Game Dept.
11 Hazen Drive, Concord, NH 03301
(603) 271-2461 • www.HuntNH.com

Revised 7-12-10 FSW10009.INDD

Appendix C General References

1. NH SPACE - Statewide Program of Action to Conserve our Environment - www.nhspace.org
2. MSD / MCC Conservation Easement Deed - Town Ledger Book 7599, Pages 250-256
3. MSD Forestry Stewardship Plan for the Buker Property
4. Bio-Diversity Conservation Plan for Merrimack (Moosehead Ecological, LLC)
5. Forest Stewardship Plan: (Brian E. Johnson, 9/25/07)
6. New Hampshire Fish and Game - www.wildlife.state.nh.us
7. US Fish and Wildlife Service – www.fws.gov
8. Wildlife Habitat Council - http://www.wildlifehc.org
9. Merrimack Geographic Information System (GIS) – www.merrimackgis.org
10. Bio-Diversity Conservation Plan for Merrimack (Moosehead Ecological, LLC)
11. Best Management Practices for Forestry – UNH Cooperative Extension
12. New Hampshire RSAs - http://www.gencourt.state.nh.us/rsa/html/indexes

Appendix D History

Who were the Graters? Why was this name selected?

Francisco Grater was born in 1750 in Barcelona, Spain. He immigrated to America in his early teens and records refer to him as Francis thereafter. He served his new country during the Revolutionary War. He enlisted in Capt. Francis Symonds' Company, a unit in Col. Glover's Regiment of MA State Troops. His enlistment was for eight months starting 20 June 1775 with his discharge on 20 February 1776.

In September 1778 he entered the State of MA service. He served on board the Schooner Swan out of Marblehead. The ship sailed to Baltimore from Boston to procure a load of flour for use by the U.S. Army. On their return trip, the vessel was captured by a British sloop of war and taken to Halifax. There Francis was imprisoned until February 1779 when he was exchanged and returned home. (Source: Pension application filed by Francis in 1832)

About 1780 he married Jane Wilson, the daughter of the captain of the ship that brought him to America. In 1801 Francis and Jane moved with their children to Amherst NH from Marblehead MA. Genealogical records indicate that nine children were born to the couple.

A classified advertisement in the *Farmers' Cabinet* of 11 December 1804 carried provides some information on the family:

> *"Muffs and Tippets made and Sold, and Fur taken in to make for any one, in the best manner, and cheap, by Mrs. Grater of Amherst, about two miles from the meeting house, on the road leading to New Boston."*

Jane Grater died 27 January 1832 at the age of 71. Francis Grater died 3 January 1845, age 94. They were both interred in the Meadow View Cemetery in Amherst. Several generations are buried in Plot 169.

Francis Grater Jr., one of their sons born 10 August 1798, was the father of Charles Edwin Grater, born 28 may 1827. Charles, the grandson of Francois, purchased land in the mid-1800's for what remains to this day as the Grater homestead on South Grater Road on the Amherst and Merrimack border.

Charles E. Grater died on July 7, 1911 and the Nashua Telegraph reported that "Mr. Grater owned a vast area of valuable woodland and was wealthy." Two articles in the local papers shed light on his life and his death in a forest fire at his farm "near Lake Baboosic".

Death in a Brush Fire

Wealthy Resident of Amherst Victim
Believed That He Was Overcome
By Heat and Fell into Flames**.**

Amherst, July 8 – Charles Grater, a lifelong citizen of Amherst, met death Friday in a forest fire at his farm near Lake Baboosic. There was no eyewitness to the tragedy but it is supposed he was overcome with the heat and fell into the flames. His body was found by neighbors soon after. It was badly burned but it is believed that death relieved him early from his sufferings.

It is stated that Grater started the fire to burn some brush and that it spread with rapidity to adjoining woodland.

The body was taken in charge by Selectmen Ernest Peaslee, Enos Robinson and Mr. Wetherbee and Medical Referee H. L. Smith of Nashua was summoned. There was no indication of foul play, it being plainly a case of accidental death.

Mr. Grater owned a vast area of valuable woodland and was wealthy. He is survived by a widow, but no children. For over 60 years he has resided on this farm and had refused many flattering offers for the forest growth.

No arrangements for the funeral have as yet been made.

It is said there was a romance in his life and he did not marry until past 60 years and it was said that he then wedded the love of his youth. He is also survived by a brother in Nashua, John Grater, who is janitor of a school house there.

In past years Mr. Grater was a noted figure in the town meetings but of late he had let matters pass into younger hands.

NASHUA TELEGRAPH,

Saturday Evening July 8, 1911

The Milford Cabinet also reported on the incident in the July 13, 1911 issue

In the death of Charles E. Grater, who passed away very suddenly while fighting fire on Friday, July 7, Amherst loses one of her oldest and most vigorous citizens. A man of rugged build, sterling character and honesty though very eccentric in manner. He spent his life as a quiet tiller of the soil exemplifying the spirit of Pope who wrote:

Happy the man whose wish and care
A few paternal acres bound
Content to breath his native air
In his own ground.

He was a deep thinker, interested in the affairs of the day, and the world of finance, and could have made a success along professional lines had he chosen so to do. He was the eldest son of Francis and Salinda (Hildreth) Grater, one of eight children and was born at the old Grater

> homestead owned by Harry J. Kathan. May 28, 1827. One brother only survives of this once large family, John A. Grater of Nashua. He leaves a widow who has the sympathy of her many friends in her sudden bereavement. Funeral services were held on Sunday afternoon, conducted by Rev. Jonathan Lewis at two o'clock, at the late home. John A. Grater, a brother of Nashua, George Grater, a nephew and Miss Chisholm, a niece of Marblehead, Mass., were present, also friends from Danvers, Nashua, Candia and other towns. Beautiful flowers bore their silent message. Interment was in the Grater lot in Meadowview cemetery.

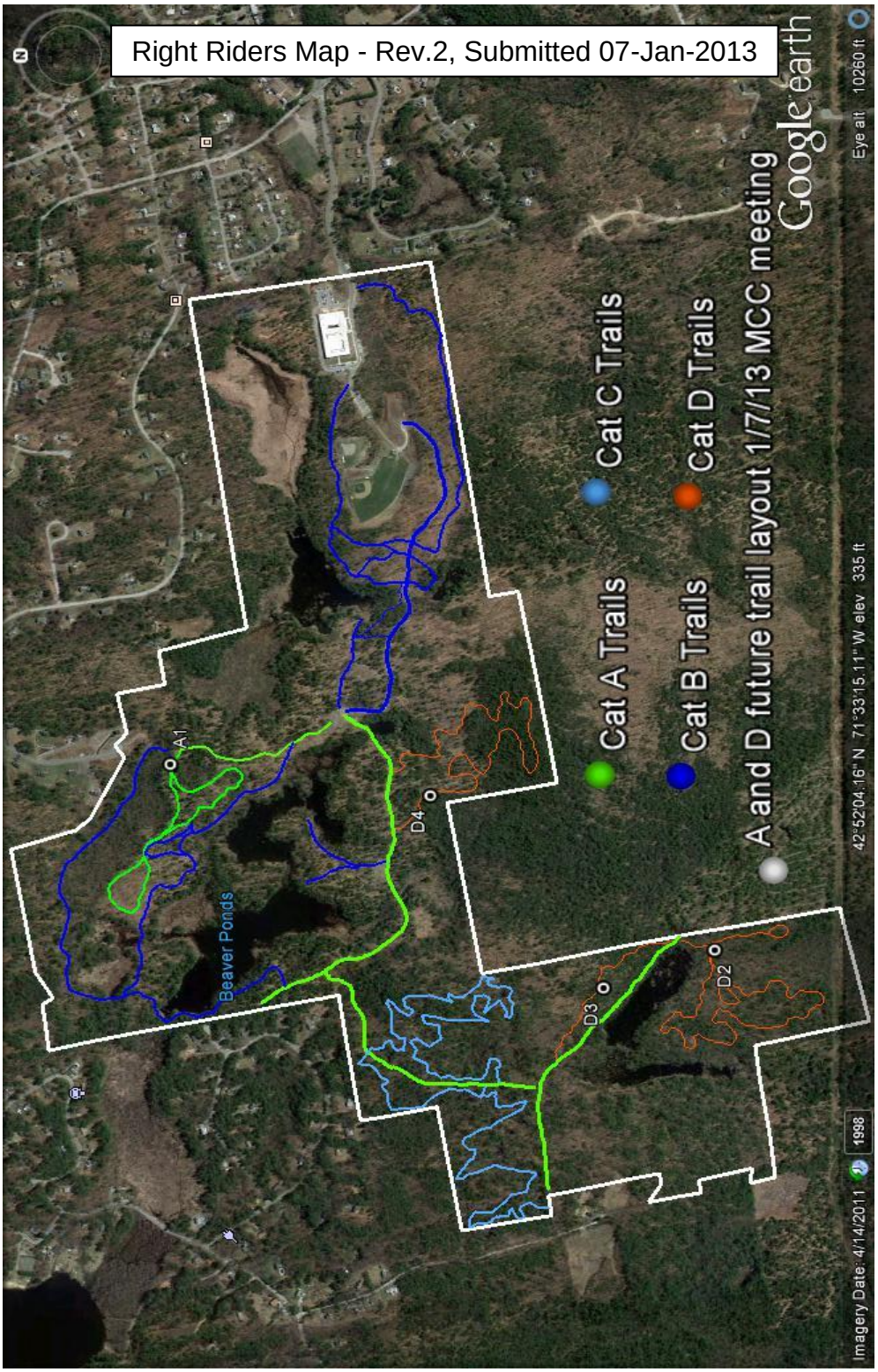
Charles Grater's widow, Flora, moved to Nashua and died there of pneumonia Feb. 22, 1920.

The land of Charles Grater passed to a nephew and thence to the nephew's children. Additional land was purchased in Merrimack by two of these children. South Grater Road, which traverses these properties, is a legacy of the Grater family name.

Appendix E Proposed Projects and Trails

1. Minimum required infrastructure projects to support future land use and other projects in this appendix include:
    a. Bottom of Gateway Hill - Correct the access through the wet area at the bottom of Gateway Hill. This project will require professional planning and potentially professional contracted services to correct.
    b. Beebe Lane – (Crossing the outlet heading North-B Trail). Correct/enhance the access at Beebe Lane as it moves towards the North. A bridge and trail updates are likely needed as this is a primary access point to the property.
    c. Wildlife Openings 1 and 2 - Fix the trail on the hills leading out of Wildlife Openings 1 and 2. Crushed stone, compaction and potentially other stabilization of the trails is needed to allow the designated uses to occur.
    d. Gates on South Grater Road - Work with the Town Council to enable the placement of gates on South Grater Road at the property lines. Place the gates once all approvals are in place.
    e. Red Maple Trail and Conservation Drive Access - Complete the Red Maple Trail Mitigation Project and correct access to that trail from Conservation Drive. This project is approved and is actively being worked. It is scheduled for completion in 2013.
2. Address Mobility Impaired access points, *trail* design and *trail* descriptions to allow *OPDMD* usability of Grater Woods.
3. Brickyard Trail – Initial *trail* layout is complete and the trail is closed. A bridge is needed to cross a seasonally wet area near the western most end.
4. Drilled Rock Trail – Initial *trail* layout is complete and the *trail* is in use. A bridge is needed to cross a wet area near the western most end.
5. An additional trail, named Environmental Trail, has been laid out and flagged but has not yet been constructed and therefore does not appear on the trail map. It will begin and end at the Education Center, looping around the Beaver Meadow.
6. Trail suggestions approved as proposed by the Right Riders (Rev. 2, submitted on 07-Jan-2013 with attached map)
    a. Trail D2 is Cat D multiuse *trail* through the woods lying to the south and east of the two beaver ponds within the Homestead parcel. It will be a directional looping *trail* back to its entrance on S. Grater road.
    b. Trail D3 is a Cat D multiuse *trail* that essentially provides a more technical bypass for the user while running parallel to the north side of S. Grater road.
    c. Trail D4 will be a Cat D multiuse *trail* located to the south of Gateway *trail*. This directional *trail* will enter and exit on Gateway.

d. Trail A1 will be a Cat A multiuse *trail* that starts and ends off Red Maple *trail* where there is currently a large fallen pine.

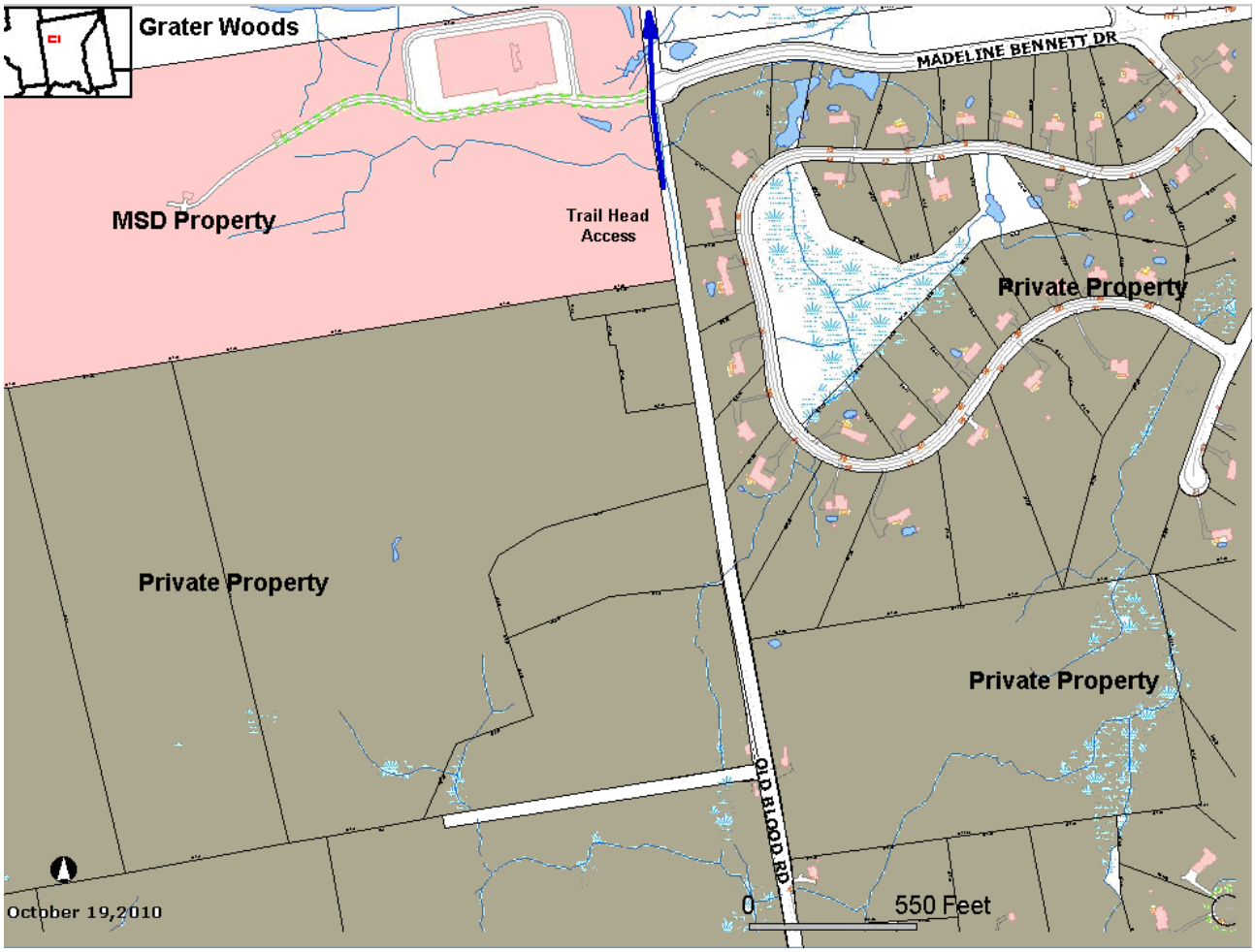


7. Old Blood Road (Future Secondary Access)

This is a portion of road known as Old Blood Road. This portion runs from Madeline Bennett Drive southerly and then to the east where it meets Wilson Hill Road. There are three sections of the road: the first is a Class VI road running through wetlands directly behind several residential properties before entering the second, A wooded area and the third where it then runs through another residential area as a Class V road. A development is being proposed for an extensive portion of this road and if approved will impact this area substantially.

1. The impact to residential areas would be great as the houses are located close to the roadway.
2. The road is close to Wilson Hill Road and Madeline Bennett Drive.
3. Ready access is limited due to wetlands and lack of parking.
4. The road is currently used by all types of motorized and non-motorized traffic.
5. The benefits of using this road as an access would greatly impacted by the proposed development in the area. Current concerns include wetland impacts, steep terrain and restricted uses of abutting School District land. Since it is a Class VI road improvements are limited at this time.

Recommendations: Access is not viable at this time, but future potential access could be negotiated as plans for the new residential development progress.



6. Skyline Trail – On the eastern end, the *trail* continues from the end of Ridge Trail and follows the current (2013) southern property line. It continues westward and intersects with South Grater Road.