

**Elementary School/Town Open Space  
Nature Trail/Outdoor Classroom  
Marlborough, Connecticut**



**Eastern Connecticut  
Environmental Review Team  
Report**

**Eastern Connecticut  
Resource Conservation and Development Area, Inc.**

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Nature Trail/Outdoor Classroom  
Marlborough, Connecticut**



Environmental Review Team Report

Prepared by the  
Eastern Connecticut Environmental Review Team  
of the Eastern Connecticut  
Resource Conservation and Development Area, Inc.

for the  
First Selectman and the  
Superintendent of Schools  
Marlborough, Connecticut

August 2003

CT Environmental Review Teams  
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## Acknowledgments

This report is an outgrowth of a request from the Marlborough First Selectman and the Superintendent of Schools to the North Central Conservation District (NCCD) (formerly the Hartford County Soil & Water Conservation District). The NCCD referred this request to the Eastern Connecticut Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on Wednesday, June 5, 2002.

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I would also like to thank Peter Hughes, town planner, Pat Young, school parent, Ann Loftus, 2nd grade teacher, Susan Rector, 1st grade teacher, Heidi Berecich, SNAP coordinator, and Jordan Tyler and Brendan Behrendt, students, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members were given additional maps and information. Some Team members made additional visits to the project site. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the town and school. This report identifies the existing resource base and evaluates its significance to potential and existing development, and also suggests considerations that should be of concern to the town and school. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in the development of environmental education programs for the school and public.

If you require additional information please contact:

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## **Introduction**

### **Introduction**

The Marlborough First Selectman and the Superintendent of Schools have requested assistance from the Eastern Connecticut Environmental Review Team in conducting a natural resource inventory and providing information for the development of environmental education programs for the elementary school and the public at the Elmer Thienes/Mary Hall Elementary School and Town Open Space Property.

The Town of Marlborough has acquired the 134 acre parcel through land purchase and open space set asides. It is located adjacent to the elementary school and may be accessed from Route 66, school property and South Main Street. Some portions of the property may be developed for support facilities for the school and the rest will remain as open space. The town has received two grants to extend an existing nature trail and to provide parking.

### **Objectives of the ERT Study**

The ERT has been requested to obtain general and specific natural resource information about the site to develop environmental education programs in conjunction with the elementary school and the public in general. Specific resource information will be used in finalizing nature trail/outdoor classroom plans. Also the information will be used to develop an environmentally based curriculum for the elementary school.

### **The ERT Process**

Through the efforts of the conservation commission this environmental review and report was prepared for the Town of Marlborough.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the town. Team members were able to review maps, plans and supporting documentation provided by the applicant.

The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;

3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted on Wednesday, June 5, 2002. Some Team members made individual and/or additional site visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.



### Location and Topographic Map

Scale 1" = 2000'





## Interpretive Nature Trail and Outdoor Classroom Elmer Thienes/Mary Hall Elementary School & Town Open Space Property

After review of the trail, school site and the K-6 curriculum overview it is obvious that this site could be well utilized as an extension to the classroom for hands-on learning in Math, Science, Art, Music, Language Arts and Social Studies. Encouraging involvement of the teachers, children, parents and community members is key in assuring that the trail and outdoor classroom will continue to be used. All too often an individual teacher moves on and all the work that has been done to establish a trail or outdoor classroom is forgotten. It is suggested that an effort be made to get as many people involved as possible to establish a solid foundation for the future development of the area.

Steps that need to be taken to insure success:

- **Provide an orientation for children, teachers, administrators, custodians, parents and the community on the present site and possible future plans. This will enable you to know what resources are available to assist you and realize any potential roadblocks.**
  - Develop a plan and invite people to a Saturday morning gathering to review and comment. Be sure to have food available and large sheets of paper around the room inviting people to comment or provide resources on various topics. Example of topics: Sources of Funding (Grants, In-Kind Donations).
  
- **Encourage other schools and organization to become involved. The more people involved - the less potential for vandalism. The visitors will become the eyes and ears for security.**
  - If vandalism does occur be prepared to clean-up, as soon as possible, and take the time to allow your students to express their thoughts and concerns about the vandalism.
  
- **Enlist the support of your custodial staff. Quite often, although usually not originally intended, it is the custodial staff who becomes responsible for the maintenance of what has been planted or constructed. This should not**

**be the case. A long-term plan should be in place on how to maintain the project.**

- Even if the custodians do not become involved in the project it will be their responsibility to maintain what is around this area by inviting their input you will make certain that you are not making their job more difficult.
- **Offer hands-on teacher workshops highlighting how to use the site to teach what is already in the curriculum. Do not expect the teachers to embrace the idea if it adds to their already overloaded schedule. Also, you do not need to take the time to develop new activities, many can be tailored to your site but have already been written.**
  - The Department of Environmental Protection's Kellogg Environmental Center and Goodwin Conservation Center are available to conduct hands-on, interdisciplinary workshops. Workshops can be offered focusing on the national curricula **Project Learning Tree, Project WILD, Aquatic WILD, Project Food, Land & People, Project WET** (Water Education for Teachers), and **Classroom FeederWatch** or a combination of the above. To obtain any of the national curricula you must attend a workshop.
  - Many other environmental workshops can be presented by DEP's Environmental Education Staff including, but not limited to, "Teaching with Gardens," "Mammals of CT," "Tree Identification," "Connecting Children's Literature & the Environment." To find out more about workshops or to arrange a workshop contact DEP' s Kellogg Environmental Center, (203)734-2513 or Goodwin Conservation Center (860) 455-9534. [www.dep.state.ct.us/educ](http://www.dep.state.ct.us/educ)

**Project WILD** is one of the most widely used conservation and environmental education programs among educators of students in kindergarten through high school. Project WILD is based on the premise that young people and educators have a vital interest in learning about our natural world.

The program emphasizes wildlife because of its intrinsic and ecological values, as well as its importance as a basis for teaching how ecosystems function. In the face of competing needs and pressures affecting the quality and sustainability of life on earth, Project WILD addresses the need for human beings to develop as responsible citizens of our planet. Contact DEP's Kellogg Environmental Center, (203) 734-2513 [www.dep.state.ct.us/educ/kellogg](http://www.dep.state.ct.us/educ/kellogg) [www.projectwild.org](http://www.projectwild.org)

**Project Learning Tree®** (PLT) is an award winning, broad-based environmental education program for educators and students in PreK - grade 12. PLT helps students learn HOW to think, not WHAT to think, about the environment. PLT, a program of the American Forest Foundation, is one of the most widely used environmental education programs in the United States and abroad.

PLT materials bring the environment into the classroom and students into the environment. The program covers topics ranging from forests, wildlife, and water, to community planning, waste-management and energy. Contact DEP's Kellogg Environmental Center, (203) 734-2513. [www.dep.state.ct.us/educ/kellogg](http://www.dep.state.ct.us/educ/kellogg) and [www.plt.org](http://www.plt.org)

**Food, Land & People's** science- and social sciences-based curriculum, *Resources for Learning*, currently serves Pre-K to 12th grade students throughout the United States. The curriculum consists of 55 hands-on lessons, developed and tested by more than a thousand educators. The subjects range from environmental science and stewardship ("Don't Use It All Up!") to human populations and land use issues ("What Will the Land Support?") Contact DEP's Kellogg Environmental Center, (203) 734-2513. [www.dep.state.ct.us/educ/kellogg](http://www.dep.state.ct.us/educ/kellogg) and [www.foodlandpeople.org](http://www.foodlandpeople.org)

**Project WET** (Water Education for Teachers) explores people's relationships to water. The 516 page curriculum guide is full of activities that are hands-on, easy to use and fun! Activities incorporate a variety of learning formats, such as large and small group learning, whole body activities and laboratory investigations. The WET curriculum itself covers the full spectrum of water-related topics and concepts, from water's role in the social and cultural contexts of our lives to its existence as a managed resource and an essential ingredient of life throughout all Earth systems. These activities promote critical thinking and problem solving skills. Contact DEP's Kellogg Environmental Center, (203) 734-2513. [www.dep.state.ct.us/educ/kellogg](http://www.dep.state.ct.us/educ/kellogg)

**Classroom FeederWatch** has students across the country watching and counting winter feeder birds such as Northern Cardinals, Black-capped Chickadees and Downy Woodpeckers and reporting their results to the Cornell Lab. of Ornithology. Some classes even write their own scientific article about their own results and get published in Cornell's newsletter "Classroom Birdscope." The Kellogg Environmental Center provides teacher training for this integrated science project and curriculum. Contact DEP's Kellogg Environmental Center, (203) 734-2513. [www.dep.state.ct.us/educ/kellogg](http://www.dep.state.ct.us/educ/kellogg) and <http://birds.cornell.edu/cfw>

**School Nature Area Project** provides year round support and training to teachers from local schools, grades K-12, who are developing interdisciplinary education programs and habitat enhancement projects using the school's nature area and trail systems. Contact the Goodwin Conservation Center at (860) 455-9534. [www.dep.state.ct.us/goodwin](http://www.dep.state.ct.us/goodwin)

- **Encourage the teachers to develop lesson plans using the site after providing them with suggested activities that have already been developed and tested.**
  - This should be part of the workshop schedule.

- **Visit other schools and talk to other teachers for ideas on developing the site.**
  - Check out the Schoolyard Habitat Network web site: [www.ctwoodland.org/shn.html](http://www.ctwoodland.org/shn.html) for additional contacts.
- **Visit local nature centers and environmental organizations to see what they have incorporated into their trails.**
  - CT Forest & Park Association, 16 Meriden Rd., Middlefield, CT
  - DEP's Sessions Woods Wildlife Management Area, Route 69, Burlington, CT
  - CT Audubon Society maintains the following sites:

**Edward Steichen Memorial Wildlife Preserve** (54-acres) Chestnut Woods Road, Redding

Huckleberry Swamp, as those who frequent it fondly call this preserve, consists of 54-acres. A boardwalk crosses over the swamp and a trail meanders through the upland. An ecological survey made in cooperation with the Yale School of Forestry and Environmental Studies was completed in 1976. A copy can be obtained by calling the CAS Office in Hartford, 860-527-8737.

**Roy and Margot Larsen Wildlife Sanctuary** (154-acres) (Adjoining the CAS Center at Fairfield) 2325 Burr Street, Fairfield

One of the most actively used sanctuaries, the property features streams, ponds, forest and fields which are managed for their diverse plant and animal communities. Seven miles of excellent trails and boardwalks with interpretive signage crisscross the sanctuary. A trail with wheelchair access is being constructed for disabled visitors. A self-guiding brochure is available at the Center. There is a nominal admission fee for non-members and non-residents of Fairfield.

**Harlo N. Haagenon Preserve** (65-acres) Creek Row, East Haddam

This 65-acre upland site includes a small field and a stream. It overlooks the Connecticut River just above the town of East Haddam. New trails and signage was recently installed.

**Trail Wood: the Edwin Way Teale Memorial Sanctuary** (156-acres)

Kenyon Road, Hampton

This is the site of Edwin Way Teale's home and subject of many of the Pulitzer Prize winning author's writings. There are well-developed trails that access woodland, field, wetland and pond habitats abounding with wildlife. Teale's writing cabin and a small museum has seasonal visiting hours. Connecticut Audubon resident staff naturalists serve as caretakers and offer guided walks of the property throughout the year.

**Bafflin Sanctuary at Pomfret Farms** (450-acres) Day Road, Pomfret Center  
Until recently, this property was a working dairy farm. A large beaver pond, extensive fields, a hemlock ravine and stream are just a few of the remarkable natural features of this property. Trails have some interpretive signage. Connecticut Audubon resident staff naturalists serve as caretakers of the property and offer guided bird walks and other environmental programs.

- **At the trailhead, or in an area easily accessible to the classes, build a storage bin for equipment (nets, buckets, hand pruners, etc.) which can be used on the trail. Older students can build the storage bin or the local high school might have a woodworking shop.**
- **Establish a resource library at the school so all teachers have access to the information. If you have the technology available to you set-up an e-group for exchange of information among the teachers. (See below)**

### **THE COMPLETE NATURESCOPE SERIES**

Created by Judy Braus, author of numerous exemplary environmental education publications, each 90-page issue features a rich collection of intriguing classroom activities for children, grades K-8. Extensive background information on each topic is followed by creative science activities and reproducible pages with games, puzzles, pictures to color, art and craft activities, creative writing projects, science experiments, songs and curriculum tie-ins. Expanded, glossaries, bibliographies, and case studies from leading scientists are featured in these very practical volumes. Published at \$12.95 each. Also offer the entire set of 15.

**SHARING NATURE WITH CHILDREN.** Cornell. NEW 20th Anniversary Edition. One of the first and best nature exploration books for children has just been revised and expanded. Features dozens of fun activities and practical ideas for outdoor and environmental educators. Useful guide for those who wish to nurture a strong sense of wonder in children. #EE-1112. \$9.95.

**SHARING NATURE WITH CHILDREN II.** Cornell. Formerly titled *Sharing the Joy of Nature*, this expansion of Joseph Cornell's legendary methods and ideas contains new activities and practical suggestions for developing effective, customized camp and outdoor education programs. Informative, practical supplement to Cornell's video and cassette, also offered by Acorn Naturalists. #EE-1113. \$9.95

**KEEPERS OF THE EARTH,** Native American Stories and Environmental Activities for Children. Caduto, Bruchac. The original Keepers featuring a fine collection of Native American stories and inspirational, interdisciplinary activities. Approach similar to subsequent Keepers, but stories and associated activities are different. In the words of Pete Seeger, "It's good to combine traditional Native American stories with science studies. Both tell us we must respect and care for the Earth." Joseph Cornell, author of *Sharing Nature with Children*, calls this volume "A sensitive and well-thought-out guide for helping children love and care for the Earth." Activities for indoor and outdoor learning. #NAT-3023. \$19.95.

**KEEPERS OF THE ANIMALS,** Native American Stories and Wildlife Activities for Children. Caduto, Bruchac. Twenty-four stories teach children about Native American culture, wildlife ecology and environmental issues. Associated interdisciplinary activities involve children in creative arts, theater, reading, writing, science, social studies, mathematics and sensory awareness. All this in a framework of uplifting Native American stories and nature activities. #NAT-3013. \$19.95.

**KEEPERS OF THE ANIMALS TEACHER'S GUIDE AND**

**READING LIST.** Companion to the text, provides teachers with dozens of practical tips. #NAT-3014. \$9.95.

**KEEPERS OF LIFE,** Discovering Plants Through Native American Stories and Earth Activities for Children. Caduto, Bruchac. The 19 Native American stories in this new book provide natural tools for sparking curiosity in children; the associated activities encourage open-ended discovery of the environment. Provides a complete program for studying botany, plant ecology and natural history. All North American biomes are included, from desert to seaside, rainforest to alpine tundra. Blends traditional scientific methodologies with Native American cultural perspectives. #NAT-3016. \$19.95.

**KEEPERS OF LIFE TEACHER'S GUIDE AND READING LIST.**

#NAT-3017. \$9.95.

**WOW! THE WONDERS OF WETLANDS,** an Educator's Guide. Watercourse, Environmental Concern. Comprehensive guide for anyone teaching about wetlands. Features 330 pages of information and activities for grades K-12. The first 70 pages feature discussions on how people have historically interacted with wetlands; how wetlands are defined; their global distribution; physical/hydrological, chemical, biological and socioeconomic benefits of wetlands; wetland plants, animals, and general ecology. Modern management options, including restoration, enhancement, and acquisition are covered along with a special section to help teachers organize field trips, prepare student checklists, and compile a basic wetlands sampling kit. The next 250 pages consist of dozens of clearly written activities for the field and classroom. Over 50 activities are organized into sections covering wetland definitions, wetland plant and animal communities, water quality and supply issues, soil factors, human factors, and suggestions for getting involved in wetland stewardship. Each activity features clear headings detailing grade levels, subject areas covered, duration, student skills, materials needed, field or lab procedures, and appropriate assessment techniques. Building your own wetland? This book offers a special appendix on creating a schoolyard wetland habitat. A goldmine of information and new activities at a very reasonable price! #WATER4108. \$16.95.

**SIGNS, TRAILS AND WAYSIDE EXHIBITS,** Connecting People

**and Places.** Trapp, Gross, Zimmerman. Are you developing interpretive panels or trail kiosks for your facility? If so, then this guide will show you the way! "How-to" suggestions for building signs and exhibits that effectively translate both the content and the spirit of a location to visitors. Chapters on design basics, wayside exhibits, the message, sign fabrication, trails - corridors to adventure, trail construction and maintenance, trail interpretation, and resources. Glossy color photographs and fine black-and-white line drawings demonstrate creative techniques that will give your facility high visibility! #IN-1102. \$19.95.

**THE BUTTERFLY BOOK,** an Easy Guide to Butterfly Gardening, Identification and Behavior. Stokes & Williams. Complete reference includes sample butterfly garden plans, lists of plants that attract butterflies, "how-to" section on raising butterflies, descriptions of 63 species supplemented by over 140 color photographs. Useful resource section lists butterfly societies, books, public displays, etc. #INV-494. \$12.95.

**EVERYTHING YOU NEVER LEARNED ABOUT BIRDS:** Lore & Legends, Science & Nature Hands-on Projects. Rupp. Children ages 9 and up will be fascinated by the lore and activities in this unusual book. Regardless of how many bird books you have, this one will not duplicate anything else on your bookshelf! #BIRD-4226. \$14.95.

**HOMES FOR WILDLIFE,** A Planning Guide for Habitat Enhancement on School Grounds. Wyzaga. This fine resource from Project H.O.M.E. (Habitat: Opportunities for Management and Education) offers hands-on learning as students design and carry out plans for improving wildlife habitat. Provides step-by-step procedures for assessing and mapping an area, developing and implementing a plan, and following the changes that ensue. Originally developed by the New Hampshire Fish and Game Department, this fine resource extends the superb concepts and activities found in Project Wild curricula. Engaging activities and worksheets are found throughout this exceptional resource. Grades K-6. Three-hole punched, unbound. #B-5668. \$18.95

**WILD School Sites.** A Guide to Preparing for Habitat Improvement Projects on School Grounds. This guide helps students and teachers learn about the importance of biodiversity, understand the basic steps of creating a wildlife habitat, develop a plan for action and gain community support. The purpose of this guide is to assist educators and their students in taking responsible action to improve their communities for people and wildlife, beginning on their school grounds. \$5.00 To order contact: [www.projectwild.org](http://www.projectwild.org) \$5.00

**PROJECT SEASONS, Hands-on Activities for Discovering the Wonders of the World.** Parrella, Smith. A fine collection of interdisciplinary, hands-on activities and teaching ideas for elementary educators. Using the school year seasons of fall, winter and spring, this book integrates science, agriculture and environmental science themes, showing relationships and interconnections. Each section contains activities and extension projects, background information and exhibit ideas. Perfect for outdoor educators, teachers, camp leaders and parents. Developed by the staff of Shelbourne Farms, an exemplary environmental education center in Vermont. #EE-6147. \$24.95.

**WORMS EAT MY GARBAGE,** How to Set Up and Maintain a Worm Composting System. Appelhof. Shows you how to recycle kitchen food wastes, save energy, product fertilizer for house and garden plants, grow fishing worms, and reduce waste disposal costs. Step by step instructions that help you achieve maximum compost production while minimizing the amount of space and time needed. Perfect introductory guidebook for all ages, 8 and up. #INV-5187. \$12.95.

**GOING NATIVE: Biodiversity in Our Own Backyards,** Brooklyn Botanic Garden Handbook # 140 . Top designers show how to combine exquisite wildflowers and other native species in spectacular plantings that provide a refuge for beleaguered plants and animals. Features scores of spectacular native plants, and garden plans for every region.

**THE BUTTERFLY BOOK,** A Kid's Guide to Attracting, Raising, and Keeping Butterflies. Hamilton. Color pictures and descriptions of butterfly biology, ecology and behavior. Useful tips on attracting butterflies as well as techniques for observing and raising them from eggs or caterpillars. Perfect introduction to butterflies for children ages 5-9. #INV-5285. \$ 8.95

**Greening School Grounds: Creating Habitats for Learning**, Tim Grant and Gail Littlejohn, (eds), 2001, Toronto: Green Teacher, 144 pages, 8 1/2 " x 11". ISBN 0-86571-436-3. Grades K-12, \$16.95 Schoolyard "greening" is an excellent way to promote hands-on, interdisciplinary learning through projects that benefit schools and increase green space and biodiversity in communities. In this new anthology from *Green Teacher* magazine, readers will find step-by-step instructions for numerous schoolyard projects, from tree nurseries to school composting to native-plant gardens, along with ideas for enhancing learning by addressing the diverse needs of students. Among more than a dozen schoolyard habitat options presented, the guide includes detailed articles on rooftop gardens, far-north gardens, desert gardens, butterfly gardens, ponds and prairie restorations. For project planners, there are practical tips on minimizing vandalism, maximizing participation and raising funds. And for teachers, there are dozens of outdoor classroom activities and curriculum links, a bibliography of learning resources, and up-to-date listings of funders and training organizations. *Greening School Grounds* is a compendium of the best schoolyard greening articles and activities from *Green Teacher*.

**Tracking and the Art of Seeing: How to Read Animal Tracks and Sign**, Paul Rezendez ISBN# 0-944475-29-9 \$19.95

**Amphibians and Reptiles in Connecticut**, Klemens, Michael W. A checklist with notes on conservation status, identification and distribution. CT Department of Environmental Protection, Bulletin # 32, \$ 11.95

**Stokes Guide to Amphibians and Reptiles**, Tynning, Thomas F., What to look for and how to interpret what you see when you observe amphibians and reptiles in their natural habitats. ISBN # 0-316-81713-9, \$14.95

**Peterson First Guides** are simplified versions of the famous Peterson Field Guides. Peterson First Guides include: **Astronomy • Birds • Clouds & Weather • Dinosaurs • Fishes • Insects • Mammals • Reptiles and Amphibians • Rocks and Minerals • Seashores • Shells • Solar System • Wildflowers** \$4.95

**The Tree Identification Book**, Symonds, George W.D., Pictorial Key ISBN 0-688-05039-5 \$17.95

**Backyard Composting: Your Complete Guide to Recycling Yard Clippings** (Harmonious Technologies) More than 500,000 copies of this useful book have been sold in the first nine printings. This new second edition contains new graphics, the latest information on composting and household refuse, and descriptions of the most current tools available to help readers get started with their own composting program. This book is a simple and easy-to-read how-to guide for composting. It is short, yet presents all the basics.

**Noah's Garden: Restoring the Ecology of Our Own Backyards**, Sara Bonnett Stein (Houghton MiMin Company). This book shows us how our landscape style of neat yards and gardens has devastated suburban ecology, wiping out entire communities of plants and animals. When Stein realized what her intensive efforts at making a garden had done, she set out to "ungarden." Her book interweaves an account of her efforts with an explanation of the ecology of gardens.



**Native Trees, Shrubs, and Vines for Urban and Rural America,**  
Cary L. Hightshoe (Wiley, John & Sons, Incorporated). A basic planting design reference, this book provides the amateur, student, and professional with information that assists in simplifying plant-use decisions where native plants are desired. The characteristics, cultural requirements, and most suitable environmental settings are identified for each plant.

**The Geography of Childhood: Why Children Need Wild Places,**  
Gary Paul Nabhan (Beacon Press). In this unique collaboration, naturalists Gary Nabhan and Stephen Trimble investigate how children come to care deeply about the natural world. They ask searching questions about what may happen to children denied exposure to wild places - a reality for more children today than at any time in human history. The authors remember pivotal events in their own childhood that led each to a life-long relationship with the land: Nabhan's wanderings in the wasteland of steel mills and power plants of Gary, Indiana, and in the Indiana Dunes; Trimble's travels in the West with a geologist father. They tell stories of children learning about wild places and creatures in settings ranging from cities and suburbs to isolated Nevada sheep ranches to Native American communities in the Southwest and Mexico. *The Geography of Childhood* draws insights from fields as various as evolutionary biology, child psychology, education, and ethnography. The book urges adults to rethink our children's contact with nature

- Sources of Supplies and Field Guides

On-Line Field Guide [www.enature.com](http://www.enature.com)

Delta Education  
[www.delta-education.com](http://www.delta-education.com)

Acorn Naturalists  
[www.acornnaturalists.com](http://www.acornnaturalists.com)

*Enhancing Your Backyard Habitat for Wildlife* by Peter Picone, State of Connecticut DEP Bureau of Natural Resources Wildlife Division, Sessions Woods W.M.A., PO Box 1550 Burlington, CT 06013  
email: [peter.picone@po.state.ct.us](mailto:peter.picone@po.state.ct.us)

## Conservation District Review

ERT Team members met with project participants on June 5th, 2002 to discuss project needs for creation of a natural resource inventory. The town has acquired a 134 acre parcel via land purchases and open space set asides, and has received a \$14,000 grant and \$16,000 Town match grant to extend an existing nature trail and provide parking. There is funding for essentially for two miles. The trail needs to be ADA accessible. Also discussed were project needs pertinent to development of environmental education programs for the elementary school that is adjacent to town owned property, and perhaps also for other civic groups and the general public.

This section is presenting information relating to soils and land use/aesthetic considerations. Information is also contained that may be helpful in classrooms about the geology and geography of the area. To that end, there are a series of GIS maps included. The maps could also be given to the school in disc-form for Power Point slides or print outs. Air photos, additional maps and soils limitations tables are also included in the Appendix.

### Existing Conditions

#### **Site Location and Slopes**

The site is located just southeast of the major civic and transportation centers of Marlborough. (*Figure 1*). Despite its closeness to the more developed area of Marlborough, there is a sense of immersion in nature when one is within the site, since very steep or moderately steep slopes border much of the site, blocking sound and focusing views (*Figure 2 and 3*). [Generally, for each variable, such as slope, one map is provided of the entire town, and one of the site at 1"= 800'.] For the most part the site goes from high to low, starting from Route 66, so that when one enters the site, one is descending.

#### **Land Use**

The site is almost completely wooded, except in a very few small areas where wells and water lines have been dug (*Figures 4 and 5*). Additional artifacts include a number of stone walls, (many of which indicate former rectangular pens or parcels. See town maps for locations) and, of more recent origin a small trail developed for and with the school. The existing trail, which is in the northeast area of the site closest to the school, was built with

volunteer effort, and includes a number of information signs about plant specimens, and a new bridge over a stream.

### **Drainage Basins, also known as Watersheds**

An analysis of the hydrology of Marlborough as a whole shows that the town contains parts of three regional drainage basins, with several sub-regional basins within each (*Figure 6*). A drainage basin is an area in which high slopes around the perimeter of an area tend to drain inward, with various streams coalescing before the unified stream moves out of the basin. The specific area of the proposed site comprises about a third of the land within a sub-regional drainage basin. This means that protection of the watercourses and wetlands within the site will have significant impact on the whole sub-regional watershed.

### **Hydrology, or Natural Water Systems(*Figures 7 and 8*)**

On the site in a low area a stream flows in from the southwest between two drumlins. The stream continues north, then circles around to the east of the site, where there is a small dam and pond/wetland. There is a second stream, which is intermittent, that also flows into the site between two south drumlins that are a bit further to the east. That stream flows north into the pond/wetland as well. The sides of the drumlins between which the watercourses flow are quite steep, minimally 15%, but generally over that, often up to 1:1. The pond appears to be dammed just downstream of it. A stream exits northeast from the pond into a large marsh that is just to the east of the site. Additionally, two vernal pools have been located in the heart of the site. They seem to be productive, and the one the group viewed was quite picturesque and engaging.

### **Glacial Geology (*Figures 9 and 10*)**

The area around the proposed open space is surrounded by drumlins (glacial hills), the downslope edges of which ring the perimeter of the site. Much of the interior area of the site is a lowland that absorbs (in wetlands and swamps) and transports (via the streams) the drainage flowing off the drumlins. The outcropping on some of the drumlin areas and the site's wet center probably has kept this land undeveloped since it stopped being farmed.

Much of Marlborough's surficial (glacial) geology, underlying its top layers of soil, is glacial till, with some areas of thick till. Till consists of glacial drift materials in heterogeneous mixtures (clay, silt, sand, gravel, boulders, unstratified [not in layers], unconsolidated, unsorted) Till accumulates from materials lodged beneath ice and from materials left behind when glaciers melt.

This site has mostly till, as well as some thick till surficial materials. There is also a long sand and gravel area to the site's east that has reportedly been mined in the past.

The two areas of thick till are associated with the drumlins of the site that end in the south portion. To qualify as "thick till", there needs to be till material at least 10' thick. In drumlins, till thickness commonly exceeds 100', while the topsoil is often poor and eroded away. Drumlins are generally quite compacted and well-drained because of their elevation, but the glacial till deposits between drumlins are usually poor drained, as is the case on this site. Drumlins offer views, although not regional views, because they are relatively low.

Drumlins are landforms, generally forming in swarms, that are different from long ridges, in that they are typically tear-drop shaped hills (the thick part of the hill tending to be to the north), perhaps 1/2 to 1 mile long and 500-1500' wide, with a height of 60-200'. The high points of drumlins often are 2/3's of the way north, and the entire drumlin typically is aligned NE/SW, parallel with glacial ice flow. They tend towards symmetry/streamlined form and regularity of slope, and they are relatively autonomous in the landscape, i.e., not part of a ridge system, etc.

The origins of drumlins are in dispute, but they probably reflect a complex interplay between glacial deposition and erosion of unconsolidated sediments. Some believe that they were made by subglacial forming/compaction of soft sediments by especially heavy moving ice. Drumlins in New England tend to have rock cores, or exposed or unexposed rock noses. Interestingly, much of the thick till in Marlborough is in the central and more historic portion of the town. Perhaps this is because of the longer views to be had from the drumlins, and because they offered well-drained high areas to build on (historically more likely along the sides of drumlins, rather than on the tops.)

### **Proposed Land Use Alternatives and Analyses of Soils**

(using newer soil data available through GIS)

The proposed trails would be 5-6' wide and made of stone dust. A gravel parking area would accommodate 10-12 cars. The proposed loop trail would extend and connect to the existing trail.

### **Major Loop Trail**

(Each segment number below corresponds to a different color leg on *Figure 11*)

1. The proposed trail begins by following along Route 66, then turning into the site where, adjacent to the trail and close to Route 66, a small gravel parking area is proposed for a relatively flat area. The parking lot would be screened from the road by existing vegetation.
2. The trail would then descend at an 8% slope for 240'.
3. For 400' it descends at a very gentle slope, 2%. It is then at the high point of a small drumlin, which is also the high point of the trail.

### **Soil Analysis for #1, #2, #3**

The first part of #1 along Route 66 passes through 61C. Canton and Charlton soils. 8-15%, very stony. This soil is well-drained till plain, with no flooding/ponding hazard. The soil is made up of gravelly fine sandy loam, gravelly loam, and very gravelly loamy sand. Placement of trails on these soils is rated as somewhat limited, due to stony conditions.

Recommendation: While trails can be located here, monitor for erosion gullies, due to stoniness. If need be, construct water bars to divert water around vulnerable areas. For the rest of segment #1, and all of #2 and #3, the trail traverses 73C. Charlton-Chatfield complex soils. 3-15% slopes very rocky. These soils occur on till plain, ridge, upland and till plain landforms. The parent material is ablation till derived from granite, schist, and gneiss, common rock of Connecticut. The soil is well drained, with no flooding or ponding hazard. Placement of trails on these soils is somewhat limited, due to stony conditions.

Recommendation: See above, 61C.

4. The trail then descends drumlin at 13% for about 600'.

### **Soil Analysis**

This descent from the high point is through 75E. Hollis-Chatfield Outcrop Complex. 15-45% slopes. This soil occurs on hill, ridge, and upland landforms, with the parent material consisting of ablation till derived from gneiss, granite, and schist. The soil is well drained and is capable of moderate erosion. It is not a flooding/ponding hazard. Rock outcrops

occur on bedrock controlled landforms Placement of trails on these soils is very limited, due to stoniness and slope.

Recommendations: Because of the steep slope, design switchbacks that follow contours. Use of water bars for water diversion along the descent from one level path to the next further down would help prevent erosion. Always try to locate the least steep areas for siting of paths. As with above recommendations for 61C and 73C, monitor for erosion gullies. If need be, construct water bars to divert water around vulnerable areas.

5. After 70' or so a small stream is crossed.

### **Soil Analysis**

#5 segment of the trail goes through 85C, Paxton and Montauk fine sandy loams, 8-15% slopes, very stony. It should be noted that the trail goes through land that in the field and on maps seems to be less than 8-15%. Paxton/Montauk soils occur on drumlins, till plain, and upland landforms, and the parent material is basal till from granite, gneiss, and schist. The soil is well-drained, and is not a flooding and ponding hazard. The minimum depth to a seasonal water table is about 27". Placement of trails on these soils is somewhat limited, due to stony conditions.

Recommendations: While trails can be located on these soils, monitor for erosion gullies due to stoniness. If need be, construct water bars to divert water around vulnerable areas.

6. From here, after the water crossing, a very gentle (2.5%) slope is followed southeast for about 130', ending at the base of a pond/wetland. This is the the lowest point of the trail.

### **Soil Analysis**

Over half of the #6 portion continues through 85C, Paxton/Montauk, as above. The last portion of #6, leading to the pond is 15, Scarboro Mucky, Loam Sand. This wetland soil occurs on terrace, outwash plain valley, river valley, depression, and drainage-way landforms. (See *Figures 10 and 12*) The material is organic matter over sandy outwash. The slope is minimal, and the land very poorly drained. Flooding is not frequent, but there is an occasional ponding hazard. The minimum depth to a seasonal

water table is about 4". There is low erosion potential, and the land is often in wetland forest, or used for unimproved pasture. Placement of trails on this soil type is very limited, due to depth to saturated zone, the content of organic matter, and potential for ponding.

Recommendations: Only use boardwalk trails within this soil type. It is suggested that less vulnerable soils be located for trail use, with, perhaps, use of short spans of boardwalks leading to the vernal pool and swamp/pool feature .

7. About 2/3's of the way along segment #6, Vernal Pool B is about twenty feet to the east of the trail.

### **Soil Analysis**

Vernal Pool B appears to be in 305, Udorthents-pits complex, gravelly. These soils occur on gravel pits, sand pit landforms, and gravelly outwash. The soils are moderately well drained, the flooding and ponding hazards none. Placement of trails is somewhat limited on these soils, due to slope.

Recommendations: Since the slope in this area is minimal, use of trails would seem to be acceptable. However, since a vernal pool is located here, trail designers might want to field check the soil to see if a different type of soil that is wet supports the vernal pool. Generally one would suspect vernal pools would occur on poorly drained soil.

8. The trail then goes north, following the edge of the pond for about 50', then veering northwest on its loop back for 900' at a gentle slope, except for about 100' at about 8% slope towards the beginning of this portion.

9. A 200' portion goes southwest, with a short 16% slope section at the beginning that could easily be corrected to 4%. The remainder of segment #9 is gentle slope.

10. Next is a 160' segment going northwest, at a gentle slope.

### Soil Analysis for #8, #9 and #10

The first third of this long portion is through 38C, Hinckley gravelly sandy loam, 3-15% slopes. The soil occurs on terrace, outwash plain, and valleys, and contains sandy and gravelly glaciofluvial (glacial river-associated) deposits. The soil is excessively drained, and has some erosion risk. There is no flooding or ponding risk. The soil capacity for locating trails is rated as favorable.

Recommendations: Though the rating for trails is good, caution should still be taken because of possible erosion potential especially where there are slopes greater than 5% or so. On slopes, switchbacks might be considered, along with water bars. Monitor for gullies.

The last portion of segment #8 has 62C, Canton and Charlton soils, 3-15 % slopes, extremely stony. The soil type is found in till plains and upland landforms. It is well-drained, but can be subject to moderate erosion. It is usually in forest or pasture. The southwest turn of #9 and the gentle northwest curve up #10 are also 62C. The capabilities of this soil type for trails are somewhat limited, due to stony conditions.

Recommendations: While trails can be located here, monitor closely for erosion gullies due to stoniness. Construction of water bars to divert water around steep and vulnerable areas is recommended. Siting of the trail on less vulnerable soil types might be considered.

11. A 100-200' gently sloped spur off this portion of the trail leads to Vernal Pool A. A boardwalk/viewing station has been proposed adjacent to the vernal pool.

### Soil Analysis

The spur to Vernal Pool A, as field located, is through 62C, as above, and then, closer to where the proposed viewing platform would be, 29A, Agawam fine sandy loam, 0-3% slope. This latter soil tends to occur on terrace, valley, and outwash plain landforms, and consists of eolian (wind) deposits over glaciofluvial deposits. The soil is well-drained, droughty, of low to medium erosion hazard, and has no risk for flooding/ponding. 29A is rated as good soil on which to locate trails.



Recommendations: For 62C, see the recommendations just previous. For the 29A Agawam soil, signs of erosion should be monitored, and water bars be constructed if gullies or other signs occur. Given that the vernal pool is located here, the soil type should be field-checked, since Agawam is a well-drained soil, rather than a water-retentive soil.

62C Agawam is also classified as Prime Farmland Soil (*Figures 13 and 14*). After confirming that this soil is indeed 62C, it might be interesting to have a small “permaculture” farming area in the woods. (Call 688-7725, ext. 113 for further information.) Certainly the area behind the school, which is also rated as good for farmland, is readily available for vegetable growing.

12. The next 400' of trail curves up to the northwest on level land.

#### **Soil Analysis**

The next level portion is again 62C, Canton and Charlton soils, 3-15 % slopes, extremely stony, as described above. Please see description and recommendations in #8, #9 and #10.

13. The next segment of the trail, (which itself connects up with the existing trail, which goes one way to the school and thence to Route 66, and the other way to the school parking lot), contains about 350' of steep terrain. A more or less direct walk to the existing trail is about 16-19% grade.

#### **Soil Analysis**

The final steep leg of the new loop trail has 61C soils, Canton and Charlton, 8- 15%, very stony. The field terrain is probably a little steeper than that. These soils are on till plain and upland landforms, and consist of ablation till. The soil is well drained, there is no flooding hazard, but it can be moderately eroded. The land tends to be in forest or pasture. Capabilities of these soils for trails are somewhat limited, due to stony conditions.

Recommendations: Because of the steep slope, work with switchbacks along the same contour levels. Use of water bars for water diversion along the descent from one level elevation path to the next would help prevent erosion. Always try to locate the least steep areas for siting of paths. Monitor for erosion gullies and construct water bars to divert water around vulnerable areas.

## Other Proposed Trail Extensions

Another possible access to the site is from Wilhenger Drive at the end of a cul-de-sac. Wilhenger Drive is off Main Street, south of Route 66. This trail, after about 700 feet would connect with the portion of the loop trail close to the Vernal Pool A. The first 220' of the proposed spur is about 9%, the middle 350' is about 15% grade, and the final portion is level.

### **Soil Analysis**

The proposed access trail goes first through 61C, Canton and Charlton, 8-15%, very stony; then 62D, Canton and Charlton soils, 15-35% slopes, extremely stony, then 62C, Canton and Charlton soils, 3-15 % slopes, extremely stony. 61C and 62C have been covered above. 62D soils are located on hills, till plains, and upland landforms, and consist of ablation till. The soil is well drained, can be moderately eroded, and is not a flooding/ponding hazard. The soil tends to be in forest or unimproved pasture. The soil capacity for trail construction is very limited, due to slope and stoniness.

Recommendations: For 61C, see #13, and for 62C, see #8, 9, 10 for recommendations. Try to avoid 62D soils as much as possible for trails. If there is no way to avoid passing through this soil type, use recommendations for 61C, but even more rigorously.

- A proposed small trail (non-loop) of about 580' follows the crest of a small drumlin. This trail does not connect with the large loop. Its entry is further south on Route 66 than the loop trail entry. This trail is on fairly level terrain that leads to one of the high points of the site (since the area along Route 66 is generally the highest of the site.) The terminus of the trail is adjacent to a wetland to the west, and is adjacent to quite steep downhill terrain to the east, perhaps offering a potentially good viewshed.

### **Soil Analysis**

The soils here are 73C, Charlton-Chatfield complex soils, 3-15% slopes, very rocky, described above in 1,2 & 3.

Recommendations: See above.

- Finally, during the site walk, a number of people suggested making a trail along the longest remaining portion of stone wall in the site, one that runs northwest to southeast, with its terminus providing easy access to Vernal Pool A. The northwest portion of the stone wall is close to the school. To gain access to the beginning of the stone wall, there is a climb along the periphery of a drumlin that averages about 12% for about 200'. The stone wall expense is about 720', then another 120' portion of stone wall runs perpendicular to the first stone wall, going southwest. (It should be noted that the second stone wall also runs about 570' in the northwest direction as well. The "T" where the stone walls meet might well be readily perceivable as the rectangular agricultural stone wall enclosure that it was.) It is a short distance from there to Vernal Pool A. Then, for variety, the loop trail can be taken back.

### **Soil Analysis**

The soils passed through are 61C, Canton and Charlton, 8-15%, very stony and 62C Canton and Charlton soils, 3-15 % slopes, extremely stony. Both have been described above.

Recommendations: See #13 for 61C, (though the town map does not indicate that this soil is as steep as 8-15%), and #8, 9, 10 for 62C. (Again, this area does not seem so steep according to town maps. As always, the steeper the slope, the higher the erosion potential).

Included is a map rating the soils on the overall site for suitability for trails (*Figure 15*), based on the most recent soils data. It is always a good idea to run trails through the more suitable areas.

### **Summary**

Because of its landforms and hydrology, i.e., high perimeter and inner wetland, this site presents a fine opportunity for an easily accessible natural refuge, one that is sheltered aurally and visually. There are numerous opportunities for learning about glaciers, geology, topography, the dynamics of water, wetlands and vernal pools, wildlife, weather, and agricultural history. Researching previous owners and agricultural practices, and

relating the knowledge back to the artifacts of the site would be a different kind of learning project. Likewise, there is prime farmland within this site, providing opportunity for hands-on learning about crop growing. Luckily, invasive plants have not overtaken the site, but it would be a good project to weed out invasive species that are there, and keep watch in the future. The main invasive species seen was barberry.

Aesthetically, the higher points of the drumlins within the sites are opportunities for vistas into the wet areas and across to the other high points. Likewise, when one is in the lower areas, the sense of enclosure from the drumlins quickly produce a feeling of getting away from development and into nature. Being able to look up into the hills and outcrops is also an aesthetic asset. A recommendation based purely on design would be to plan trails to enhance views to the natural features. In addition to those commented on above, these features include various wetland/watercourse conditions, and areas of plant communities, such as masses of ferns. The way a trail is laid out can enhance views and create elements of diversity and surprise. If any small areas are to be cleared to meadow to provide habitat for certain kinds of wildlife, do the clearing where an open view would be to an advantage, e.g., by the “T” in the long stone walls.

All that said, this site has limitations that call for informed sensitivity in trail planning. It would be helpful to have a soil scientist verify the soils of the site, and then to maximize use of the more resilient soils for the trail. The most recent soil data indicate that many of the soils are either susceptible to erosion, or are wet. As much as possible, wet soils should be worked around, perhaps with occasional short forays to wetland features via boardwalks. Steep slopes and the stoniness of the soil are limitations of the non-wetland soils on this site. Switchbacks are recommended for steep slopes, not only to protect the slope from erosion, but also to provide ADA access. Use of waterbars with switchback trails is detailed in the report. This trail, in many of its non-wetland soils, will have to be monitored for signs of erosion gullies. When they are spotted, water bars are the first line of defense.



Figure 1- Marlborough Roads, Trail Site

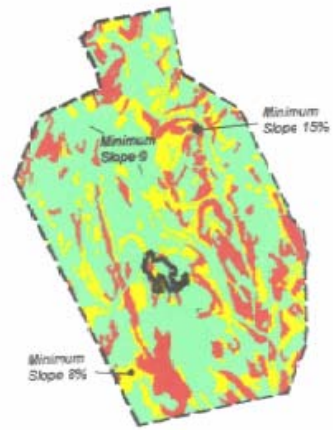


Figure 2- Marlborough Minimum Slopes



Figure 3- Site Minimum Slope



Figure 4- Marlborough Land Uses

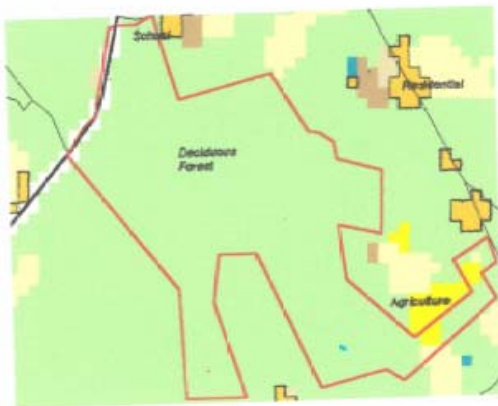


Figure 5- Site Land Use

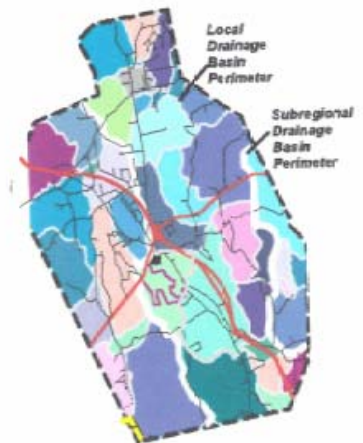


Figure 6- Marlborough Drainage Basins



Figure 7- Site Hydrology and Wetlands



Figure 8- Site Geology and Drainage

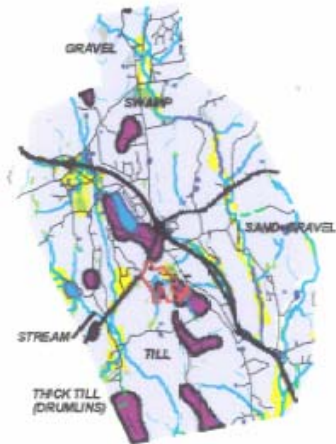


Figure 9- Marlborough Glacial Deposits

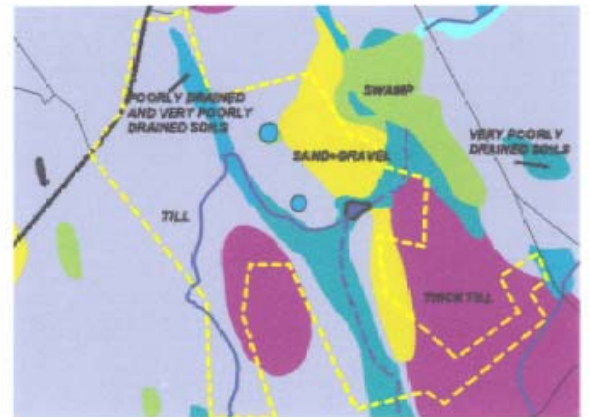


Figure 10- Site Glacial Deposits



Figure 11- Site Trail Evaluation Guide



Figure 12- Site Soils and Trails



Figure 13- Marlborough Prime Farmlands



Figure 15- Summary of Site Soil Limitations for Trail Building



Figure 14- Site State Designated Prime Farmlands

## **The Natural Diversity Data Base**

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact Dawn McKay if you have further questions at 424-3592. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.



## Vegetation

The ±134 acre open space parcel located adjacent to the Elmer Thienes/Mary Hall Elementary School was recently acquired by the town of Marlborough for public education, passive recreation and natural resource conservation. This property may be divided into several broad vegetation categories. These include several mixed hardwood stands; the hardwood swamps associated with several streams, some of which are intermittent; several old field hardwood areas; an open marsh and several old field areas. Below are brief descriptions of each of these vegetation categories. The location and acreage of these areas were obtained from 1995 aerial photographs and are only approximate. They are depicted on the Vegetation Type Map. The majority of the field inventory of vegetation types was conducted in March of 2003. A botanist should make a more comprehensive inventory of the herbaceous vegetation that is present in each of these categories at different times throughout the year.

The vegetation that has developed on this property is quite diverse and strongly reflects the soils that are present and the past use of the land. Shallow to bedrock soils with numerous rock outcrops, wetlands and disturbed areas dominate the forested portions of this property.

A clear succession from once open pastureland delineated by old stone fences to a dense mixed hardwood forest is apparent. As a result of this succession the trees are older and generally larger in the areas that were abandoned first. Younger trees including, pioneer species such as gray birch and eastern red cedar are present in the areas that were abandoned more recently. Several of the young mixed hardwood areas have developed on sites that were disturbed by extensive excavation in the past.

At this time, forest management aimed at improving forest health that generates revenues from the sale of sawtimber is not feasible. Removal of unhealthy, poor quality pole size trees to reduce crowding and improve forest health would only be feasible if a strong fuelwood market were to develop as a result of rising fossil fuel prices. The condition of this forest should be re-evaluated in approximately ten years to determine the suitability of management at that time.

The majority of this property is well suited to environmental education, conservation and passive recreation. Upgrading some of the old cart roads that are present into hiking and nature trails would not be difficult. Additional loop trails could be developed by connecting some of the existing trails. The construction of a boardwalk trail into a portion of one of the hardwood

swamp/streambelt areas or the open marsh area would create an exceptional educational experience while limiting environmental impact. The removal of risk and hazard trees that are present along the existing trail network should be a priority if use of this area is going to be encouraged.

Several non-native invasive plant species have become established within this property. These include Japanese barberry, multiflora rose, common reed, Asiatic bittersweet and autumn olive. Although some of these species provide wildlife with food and cover, they are aggressive competitors with native plant species and are capable of taking areas completely over. Complete eradication of these invasive species will probably not be possible, however it is very important to recognize what these species look like and to stop their spread to areas where they are not yet established.

## Vegetative Type Descriptions

### **A. Mixed Hardwoods.**

This Mixed Hardwood vegetation type totals approximately 33 acres and is generally restricted to areas that have well drained upland soils. Pole and small sawtimber size trees that are becoming crowded in some areas dominate this vegetation type. They range from 60 to about 110 years of age. Larger and older trees are present but they are few in numbers and scattered. The overstory in this vegetation type is dominated by cankered black birch, red maple, shagbark hickory, pignut hickory, mockernut hickory, black oak, scarlet oak, red oak, white oak with lesser numbers of American beech, sugar maple and sassafras mixed in. Red maple, white ash, sugar maple, red oak, yellow birch, black gum and tuliptree dominate where this Mixed Hardwood type makes a transition to the Hardwood Swamp type. White pine, pitch pine, hemlock and eastern red cedar are present in low numbers on some of the droughty shallow to bedrock knoll tops. Some of the larger trees that are present have cavities that are suitable as nesting sites for wildlife. The understory vegetation that is present includes hardwood tree seedlings, hop-hornbeam, American hornbeam, maple leaved viburnum, American chestnut sprouts, witch-hazel, highbush blueberry, lowbush blueberry, huckleberry and scattered patches of mountain laurel. The mountain laurel has become dense on several of the west facing slopes. Unfortunately Japanese barberry, a non-native invasive species has also become established in some areas. Ground cover vegetation includes poison ivy, Virginia creeper, green briar, rattlesnake plantain, sheep laurel, Canada mayflower, wood aster, club

moss, evergreen wood fern, hayscented fern, Christmas fern and many other species of grasses, sedges and wild flowers.

### **B. Hardwood Swamp.**

There are several Hardwood Swamp areas that total approximately 30 acres located within this parcel. Most are associated with the small streams and intermittent brooks that are present. Red maple is dominant in the overstory with occasional yellow birch, white ash, black gum, sassafras, tuliptree, black birch and bigtooth aspen. All size classes of trees are represented in these wetlands. The vegetation that is present in the understory is quite variable from area to area. Highbush blueberry, spicebush, sweet pepperbush, arrowwood viburnum, deciduous holly, swamp azalea, witch-hazel, poison sumac, Japanese barberry, multiflora rose and mountain laurel are all present in one area or another. Skunk cabbage, false hellebore, tussock sedge, club moss, sphagnum moss, poison ivy, green briar, Virginia creeper, grape, cinnamon fern, sensitive fern, evergreen wood fern, royal fern, sedges and many wild flower species are present throughout as ground cover. Some of the larger red maples that are present have cavities that make excellent den sites for many species of wildlife including wood ducks. There are also many standing dead trees (snags) that are being utilized by a variety of birds.

### **C. Mixed Hardwoods.**

There are approximately 24 acres of Mixed Hardwoods that are dominated by pole size black birch and red maple with occasional sawtimber size red oak, tuliptree, sugar maple and American beech. The trees in this vegetation type are crowded and declining in health and vigor. Hardwood tree seedlings, witch-hazel, maple leaved viburnum, and highbush blueberry dominate the understory vegetation. Ground cover vegetation includes poison ivy, club moss, evergreen wood fern, Christmas fern and Canada mayflower.

### **D. Old Field Hardwoods.**

Approximately 26 acres of Old Field Transition Hardwoods are present on this property. This ±16 acre area (Area D.) is dominated by pole size red maple and black birch with eastern red cedar, gray birch and bigtooth aspen present in varying densities and conditions throughout. The cedar, gray birch and aspen are declining due to competition with more shade tolerant hardwood species. Occasional large black oak, red oak, pignut hickory and tuliptree are present. Several of these trees have large spreading crowns and were probably present when this area was used as pasture. Hardwood tree seedlings are present in the understory along

with witch-hazel, maple-leaved viburnum, highbush blueberry and lowbush blueberry. Christmas fern, Canada mayflower and club moss dominate the ground cover vegetation.

### **E. Mixed Hardwoods.**

Based on the irregular micro topography and the species that are present this ±15 acre area appears to have been disturbed by extensive excavation in the past. At present it is vegetated with a dense stand of seedling, sapling and pole size red maple and black birch with occasional gray birch, eastern red cedar, black cherry, American elm and bigtooth aspen intermixed. Japanese barberry, mountain laurel and highbush blueberry are present in the understory. Ground cover consists of poison ivy, sheep laurel, hayscented fern and club moss.

### **F. Old Field Hardwoods.**

There are two hill top areas that are vegetated with Old Field Transition Hardwoods present within this property. They total approximately 10 acres and are dominated by crowded sapling and pole size eastern red cedar, black birch, red maple, black oak, red oak, scarlet oak, white oak, pignut hickory, mockernut hickory and shagbark hickory. Occasional gray birch, black cherry, bigtooth aspen and tuliptree are also present. Many of the trees appear to be stressed as a result of the droughty, shallow to bedrock soils that are present. Some of the largest trees are in very poor condition as a result of having crowns that have been damaged by ice storms. Understory vegetation includes hardwood tree seedlings, highbush blueberry, witch-hazel, American chestnut sprouts, old field juniper, Japanese barberry, lowbush blueberry and huckleberry. Pennsylvania sedge, club moss, partridgeberry, greenbrier, Asiatic bittersweet and poison ivy make up the ground cover that is present.

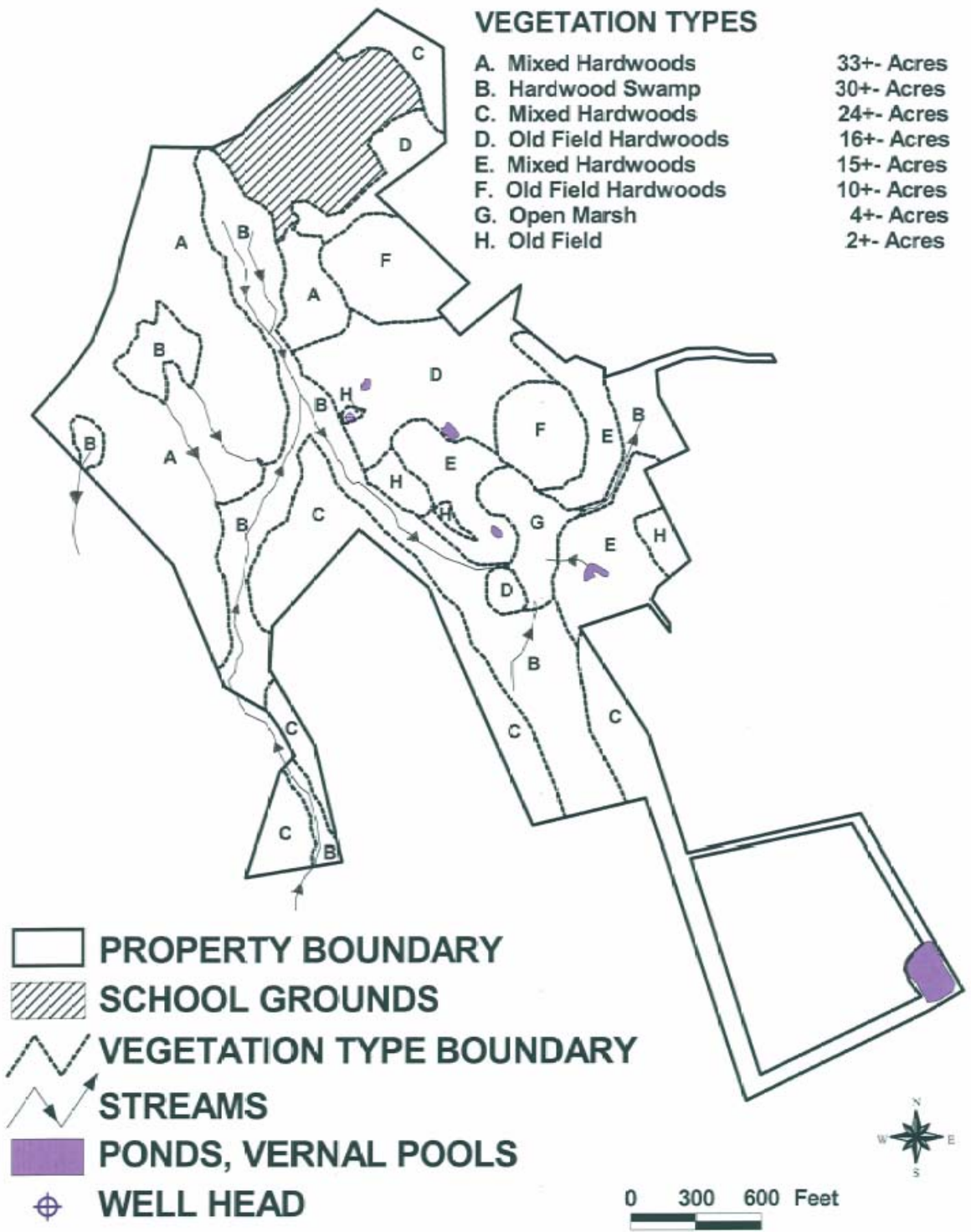
### **G. Open Marsh.**

This ±4 acre area includes both Open Marsh and Open Shrub Swamp. Both areas may have varying amounts of standing water depending on the time of year and precipitation levels. The Open Marsh is dominated by common reed, tussock sedge and sphagnum moss. The vegetation that is present in the Shrub Swamp includes red maple seedlings, gray birch seedlings, occasional white pine seedlings, speckled alder, arrowwood viburnum, steeplebush, meadowsweet, highbush blueberry, sweet pepperbush, autumn olive, mountain laurel, common reed, sphagnum moss and tussock sedge.

## **H. Old Field.**

Several small Old Field areas that total approximately 2 acres are present within this tract. The area near the well was recently cleared and is just beginning to re-vegetate naturally with grasses, sedges and hardwood tree seedlings. White pine seedlings and saplings that were planted many years ago dominate another area just to the south. This area and the two areas to the east include seedling and sapling size red maple, gray birch, black birch, black cherry and quaking aspen that have become established on their own. Shrub species that are present include old field juniper, mountain laurel, bayberry, sweet fern, Japanese barberry, highbush blueberry, sweet pepperbush and autumn olive. Herbaceous vegetation and vines include grasses, sedges, poison ivy, greenbrier, sheeplaurel, steeplebush, dewberry, cinquefoil, hayscented fern, club moss and many wild flower and weed species.

# VEGETATION TYPE MAP



## Wildlife Resources

This section of the report will address the following: current conditions for wildlife, recommendations for management and enhancement, planning for wildlife, nature trail potential and other considerations.

### Current Conditions

The following wildlife were observed during two site visits (June 5 and July 12, 2002) either directly or indirectly by identifying calls, tracks, scat or other sign: white-tailed deer (*Odocoileus virginianus*), eastern coyote (*Canis latrans*), gray squirrel (*Sciurus carolinensis*), chipmunk (*Tamias striatus*), American robin (*Turdus migratorius*), wood thrush (*Hylocichla mustelina*), ovenbird (*Seiurus aurocapillus*), red-eyed vireo (*Vireo olivaceus*), scarlet tanager (*Piranga olivacea*), red-bellied woodpecker (*Melanerpes carolinus*), Eastern phoebe (*Sayornis phoebe*), downy woodpecker (*Picoides pubescens*), tufted titmouse (*Parus bicolor*), northern cardinal (*Cardinalis cardinalis*), carolina wren (*Thryothorus ludovicianus*), house sparrow (*Passer domesticus*), brown-headed cowbird (*Molothrus ater*), killdeer (*Charadrius vociferous*). It can be expected, with more thorough field investigations, that the species list will be large for the property.

### Habitat Conditions

The Elmer Thienes/Mary Hall Elementary School side of the property is developed with grass fields, parking lots and buildings. Adaptable songbirds such as the robin and cardinal are common there. A killdeer was observed hunting for insects on the school grounds and most likely nests on the roof of the school. The southeast side of the School's property has an area of swamp forest which consists mostly of red maple including some tulip poplar and understory shrubs including spicebush, winterberry, arrowwood viburnum, highbush blueberry and American hornbeam. A variety of herbaceous ground covers are present including skunk cabbage and ferns.

The adjoining open space property is forested with several interesting habitat features including a vernal pool and intermittent stream. The property consists mostly of mixed oak-hardwood

forest with a mixture of maples, oaks, birches, ash, and hickories. Higher areas with rocky exposed ledge have shrub layer vegetation such as black huckleberry, low bush blueberry and maple-leaf viburnum. Upland areas contain a variety of herbaceous ground cover.

The following non-native invasive plants were found on the property: winged euonymus (*Euonymus alatus*), autumn olive (*Eleagnus umbellata*), Oriental bittersweet (*Celastrus scandens*), and Japanese barberry (*Berberis thunbergii*). These species are introduced plants which were not part of Connecticut's landscape prior to European settlement. These are particularly invasive and compete with many native species for growing space which leads to a decline in biodiversity.

Marlborough 15,032.40 acres      23.49 square miles

Land Use/Land Cover	Acreage	Percent
1 - impervious surfaces	4.45	0.03
2 - high density residential/commercial	36.52	0.24
3 - medium density residential	264.86	1.76
6 - turf grass	7.11	0.05
7 - soil/hay/grass	321.41	2.14
8 - grass/hay/pasture	334.45	2.22
9 - soil/corn	11.78	0.08
10 - grass/corn	5.34	0.04
<b>11 - forest-deciduous</b>	<b>13,009.53</b>	<b>86.54</b>
14 - forest-coniferous	159.06	1.06
15 - water-deep	93.60	0.62
16 - water-shallow	138.01	0.92
17 - wetland-nonforested	14.01	0.09
18 - wetland-forested	236.49	1.57
19 - barren land	82.70	0.55
20 - bare soil	52.47	0.35
25 - road-major	260.62	1.73

Table 1 - Marlborough Land Use / Land Cover Statistics, DEP GIS Data, 1996



### Forested Conditions

As you can see in Table 1, Marlborough is predominantly deciduous forest (over 80 percent). The predominantly forested condition is good for a variety forest-dwelling wildlife. However, maintaining a healthy forest ecosystem will be a challenge. Although there are plenty of woods, the quality of those woods will depend on management strategies employed by the landowner or land manager of the wood lots. The challenge for this property will be to balance the recreational goals and maintain wildlife habitat quality. Invasive non-native species should be opportunistically removed so as to not let them get a foothold.

### Nature Trail Development

Wildlife habitat is represented by the collective summation of all the environmental factors that occur at a given location such as food, water, cover and their spatial arrangement. As Marlborough's natural areas become smaller and more isolated, the value of publicly-owned natural areas will increase. In a survey of urban residents in five metropolitan areas of New York State, 93 percent of the respondents indicated that it was important for their children to learn about nature and 73 percent were interested in wildlife in the backyard or neighborhood area (Brown et al. 1979). This property can be useful in teaching the citizens of the community how to recognize the various components of habitat and help them understand the **function of habitat** and the **importance of habitat** for the **existence of wildlife**. With careful planning, it has the potential to be an effective learning environment. The property can be utilized to teach residents how to recognize the various habitat components. The trail system can serve to point out the varying habitat types and natural points of interest. The various habitat components can be identified by trail markers or signs. A trail guide can be developed which corresponds to numbered stops along the trail. This can reduce the maintenance of signage and requires trail users to pick up a guide from a centralized trail head, school office or town hall. Several self-guided trails have been developed across the State. A visit to these areas is recommended to gain insight on trail markers, trail use and vandalism issues. For a list of locations please contact the Team wildlife biologist at 860-675 8130.

Trail location should be sensitive to soil erodability and wetlands. The trail should adhere to strict standards which limit crossing over steep areas and reduce wetland degradation. Trail beds should be groomed and dressed appropriately with wood chips, gravel or stone dust.

Trailside vegetation should be pruned each year to prevent constrictions, however excessive pruning should be avoided. Poison ivy, although a wildlife food, should be appropriately controlled along trail sides to maintain comfort of trail users. During the site walk on June 5th, a proposed trail was walked with town officials. It appeared, from the site walk, that the proposed trail location was appropriate. Care should be exercised during the grading of the trail so as to not cause erosion of the soil into the stream or vernal pool.

### **Wildlife Refuge Issue / Nature Trails**

To minimize wildlife impacts, nature trails should not be allowed to criss-cross the entire property. Trails should allow some parts of the property to remain as refugia where wildlife remain undisturbed by large volumes of foot traffic especially during the nesting season. Hikers should be informed about the need for leaving some areas undisturbed. Although there are over 100 acres of land, too many trails and too many people can be detrimental to some wildlife. One main walking trail with some smaller “dead end” branches to natural features is recommended. Effort should be made to keep at least 25 percent of the property with no hiking access. Improvement of the existing school nature trail is recommended so that teachers can take their classes out for a short lesson. An outdoor seating arena in the woods next to the school's playground would greatly benefit the outdoor learning experience. Vandalism proof materials should be used (consult John Barry Elementary School outdoor classroom in Meriden).

The trail system can serve to point out the varying habitat types and other points of interest on the property. The various habitat components such as:

- Spring foods
- Summer foods
- Fall berries
- Winter persistent berries
- Conifers and evergreens
- Nut sources
- Herbaceous plants and wildflowers
- Nectar plants
- Dead or dying trees

- Artificial nest boxes
- Man-made brushpiles / rock piles
- Water sources / vernal pools

Each habitat component contributes, in some way, to the ecology of the property. The various components can be identified by trail markers or signs. Also, a trail guide can be developed which corresponds to numbers along the trail. This can reduce the maintenance of signage and requires trail users to pick up a guide from a centralized trail head or town hall.

### **Habitat Management and Planning Considerations**

The distribution and combination of various of vegetative types and tree size classes are important to consider when managing forest land for wildlife for the long term. In general, the greater the range of tree size classes present, the greater the potential that more wildlife species will present (Degraaf et al. 1992). Important to wildlife habitat is the vertical and horizontal structural diversity. The vertical layering of the trees, shrubs, vines, herbs and thallophytes (lichens and mosses) and the horizontal diversity (known as “patchiness”) of the forest are important to consider to encourage diverse wildlife habitat conditions. Professionally applied modern forestry operations can be utilized to manage and enhance wildlife habitat by encouraging vertical and horizontal structural diversity. It is recommended that the town hire a reputable professional forest consultant assess the property and write a long range plan for this property with the goals and objectives of the town (property owner).

Controlling invasive non-native plants is important and requires a diligent application of mechanical removal by hand, pick and shovel, and tractor (back-hoe). Also, application of herbicides may be necessary for some invasives to prevent resprouting of cut stumps (if herbicide use is a major concern - least environmentally sensitive compounds can be used). The need for controlling invasive non-natives outweighs the risks of utilizing herbicides.

Planting a variety of native trees, shrubs and wildflowers will enhance the seasonal food and cover and improve habitat conditions. Plant materials should be of native sources as much as possible. Native plant species which restore and enhance natural habitat conditions should be utilized and invasive non-native species avoided. The following is a partial list of non native invasive plants which **should not be planted**:

**Non-native Trees**

Norway Maple (*Acer platanoides*)  
 Tree of Heaven (*Ailanthus altissima*)  
 Catalpa (*Catalpa spp.* )

**Non-native Shrubs**

Autumn Olive (*Elaeagnus umbellata*)  
 Russian Olive (*Elaeagnus angustifolia*)  
 Winged Euonymus (*Euonymusalatus*)  
 Burning bush (*Euonymus atropurpureus*)  
 Privet (*Ligustrum spp.* )  
 Tartanan honeysuckle (*Lonicera tatarica*)  
 Common buckthorn (*Rhamnus cathartica*)  
 Glossy buckthorn (*Rhamnus frangula*)  
 Multiflora rose (*Rosa multiflora*)

**Non-native Vines**

Asiatic bittersweet (*Celastrus orbiculatus*)  
 Japanese honeysuckle (*Lonicera japonica*)

Plantings of native trees, shrubs and wildflowers can enhance conditions for wildlife in the area. Diversifying the seasonal availability of food sources such as planting spring, summer and fall food sources or winter persistent food sources. The following native plants can be used to enhance the property for wildlife:

**Native shrubs:**

Gray dogwood (*Cornus racemosa*)  
 Silky dogwood (*Cornus amomum*)  
 Arrowwood viburnum (*Viburnum recognitum*)  
 Common Elderberry (*Sambucus canadensis*)  
 Winterberry (*Ilex verticillata*)  
 Sweet Pepperbush (*Clethra alnifolia*)  
 Highbush Blueberry (*Vaccinium corymbosum*)  
 Black chokeberry (*Aronia melanocarpa*)

Red chokeberry (*Aronia arbutifolia*)

Bayberry (*Myrica pensylvanica*)

**Native trees**

Flowering dogwood (*Cornus florida*)

Black Cherry (*Prunus serotina*)

Pin Cherry (*Prunus pensylvanica*)

White pine (*Pinus strobus*)

Eastern Red Cedar (*Juniperus virginiana*)

American Holly (*Ilex opaca*)

Common Hackberry (*Celtis occidentalis*)

Red Mulberry (*Morus rubra*)

**Meadow environment plantings**

Encourage native wildflowers. Plant/seed native wildflowers throughout the open meadow areas.

**Native plant sources:**

New England Wildflower Society, Inc.

Garden in the Woods

Hemenway Road

Framingham, MA 01701-2699

Tel. 617-237-4924 or 877-7630

DEP Forestry Division

Seedling Program

Pachaug State Nursery

Box 23A, 190 Sheldon Road

Voluntown, CT 06384

Tel. 860-376-2513

## **Other Habitat Management and Wildlife Considerations**

**A- Creation of Winter Habitat-** Clusters of evergreens can be planted to enhance winter cover habitat for owls, local songbirds and other wildlife. This practice can help mitigate the statewide loss of Eastern Hemlock due to the wooley adelgid infestation. Further information is available upon request.

**B- Creation of Super Brush Piles -** To increase habitat for cottontails, salamander, toads, and a variety other wildlife, brush piles can be created along forest edges. See Appendix for information sheet.

**C- Comprehensive Wildlife Inventory-** An comprehensive inventory of wildlife on open space properties should be made. This should include seasonal inventories during nesting seasons, migration periods and winter periods. Seasonal monitoring for a few years will help get further information on vernal pool use and upland habitat use by amphibians.

**D- Maintenance of Dead or Dying trees -** Dead or dying wood is part of habitat for wildlife, especially woodpeckers and a whole host of secondary users such as screech owls (*Otus asio*), bluebirds (*Sialia sialis*) and flying squirrels. A minimum of 3-5 snags (dead or dying trees) per acre should be present or created per acre of forested area. Larger snags are more valuable, although snags a small as 3 inches in diameter are utilized by wildlife. For safety reasons, tall snags should not be left close to trails or other high human traffic is expected.

**E- Create Snags or Dead or Dying Standing Wood -** Create snags by girdling invasive trees and subordinate cull native trees to enhance primary (i.e. woodpeckers) and secondary (i.e. Tufted Titmouse) cavity users. Three to five snags per forested acre minimum requirement should be attained.

**F- Artificial Nest Box Placement -** Placement and Management of nesting structures in appropriate areas can assist cavity-dwelling wildlife species such as bluebirds, tree swallows, flying squirrels, screech owls, kestrels, wood ducks, and hooded mergansers. The Team wildlife biologist is available to provide nesting structure plans and field placement advice.

**G - Create Native Wildflower Edges along Trail -** At several locations along the nature trail, native perennial wildflowers can be planted to enhance conditions for butterflies.

The trail edge can be “Daylighted,” see Appendix for Fact Sheet, and existing wildflowers can get more light and additional native wildflowers can be added in through planting. The Team wildlife biologist is available for further information.

### **Practical Wildlife Censusing Techniques**

Counting or documenting the presence or absence of wildlife along the trail can be both fun and educational for the trail users. It also teaches the importance of record keeping and identification of wildlife (directly or indirectly).

- Locate nests and other wildlife occurrences
  - seasonally locate nests and plot locations on maps
  - find den trees and natural cavities in trees and find out what animal is using it.
- Owl hooting Survey
  - play and owl hooting tape and listen for response
- Bird Count
  - document their seasonal presence
- Snow Tracking
  - following a light snowfall (2-3 inches), animal tracks can be identified and followed to see where they are travelling to and from. Also, they may detect what the animal is doing or eating.

### **Human - Wildlife Conflicts and Unleashed Dogs Along Trails**

Some wildlife-related problems become apparent as public nature trail areas usage increases. Some trail users want to bring their dogs along with them. Although leash laws are in place, they are seldom adhered to or adequately enforced (Picone, personal observation). Unleashed dogs along trails pose human dangers through biting but can also adversely impact the wildlife resource. Particularly affected are ground nesting birds and mammals in the spring and summer seasons. As trail users walk along trails, unleashed dogs may disturb ground nesters. Repeated

disturbance of ground nesters may lead to nest abandonment. Also, dogs allowed to run through or jump into vernal pools can also be destructive to these special habitat areas. A ban on dogs in the natural area starting March 1st through September 30th would help avoid these wildlife impacts. Dogs, under the owner's control, do not pose a major problem for wildlife in the fall and winter periods.

## **Conclusions**

This property provides the town of Marlborough a unique opportunity to bring its citizens closer to nature and, at the same time, improve habitat and reduce impact to wildlife. The proximity of the property and trail to the Thienes Elementary school allows for a unique opportunity for teachers and school children to use the area as an outdoor laboratory/classroom to learn about the natural sciences. Caution should be exercised by developers of this trail so that construction of the nature trail does not cause erosion of soils and/or sedimentation of the vernal pool or stream. A variety of habitat enhancement measures can be implemented along the trails and open space property to teach the citizens of Marlborough about wildlife and wildlife habitat. Trails should not be allowed to criss-cross the entire property which can degrade the wildlife value. Town officials should consider banning dogs from the property during bird nesting season (March 1 through September 1) to protect ground nesting birds and other young wildlife. The property could be surveyed for wildlife during the various seasons of the year to gain more information on wildlife use and presence. For more information and further technical help please contact the Team wildlife biologist at DEP Wildlife Division, Sessions Woods Wildlife Management Area, Route 69, Burlington, CT 06013, Tel. (860) 675-8130.

## **Literature Cited**

Brown, T.L., C.P.Dawson, and R. L. Miller. 1979. Interests and attitudes of metropolitan New York residents about wildlife. *Tran. of North American Wildlife and Natural Resource Conference*. 44:289-297.

DeGraaf, R. M.; Yamasaki, M.; Leak, W. B.; and J.W. Lanier. 1992. *New England Wildlife: Management of Forested Habitats*, General Technical Report NE- 144, U. S . Government Printing Office, Washington, D.C.272 pp.



## **Fish Resources**

### **Unnamed Tributaries to Lyman Brook**

The watercourses on the Town of Marlborough property are intermittent, joining together and flowing in an easterly direction before emptying into Lyman Brook, a tributary of the Blackledge River. On the property, these watercourses do not appear to support fish communities. It is possible that warmwater pond species may live in some of the wetland and pond habitat west of Main Street, however, the most suitable stream fish habitat exists within the stream in areas east of Main Street. One of the more important functions of small headwater streams is to provide clean and unpolluted water to downstream areas of a watershed, which contain an increased diversity of aquatic organisms. Surface waters of these watercourses are classified by the Department of Environmental Protection (DEP) as "Class A." Designated uses for this classification are: potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply, and other legitimate uses.

### **Watershed**

#### **Salmon River**

From an education standpoint, it is important to stress that watercourses on the property although small are an integral part of an entire network of streams that comprise the Salmon River Watershed. The Salmon River has long been regarded as a valuable recreational and ecological resource in Connecticut. The river is one of the most diverse and utilized fishery resources in Connecticut containing some 18 species of freshwater, anadromous and catadromous fishes. The Salmon River is considered a major trout stream in Connecticut and the New England area. It is annually stocked with more than 20,000 adult brook, brown and rainbow trout, the largest amount of stocked trout than any other resource in the state. The river contains a special designated "Trout Management Area" where angling is limited to catch and release regulations on a seasonal basis and a section is limited to fly fishing methods only.

Based on angler surveys, the Salmon River is second only to the Farmington River in regards to number of angler hours spent (6,809 hours/km) on the river. This high degree of usage translates into a very high degree of economic return to the region as monies are spent for food, bait, tackle, lodging and travel to and from the Salmon River. Net economic impact in the spring per kilometer of stocked stream was determined to be \$82,920/km, the second highest

economic return in state. As a comparison, the average spring economic return for stocked streams in Connecticut was \$4,592/km.

The Salmon River Watershed has long been the major focus of the Connecticut River Atlantic salmon restoration project. Atlantic salmon are the only large anadromous salmonid native to Connecticut. The Salmon River Watershed provides critical nursery habitat for juvenile and adult Atlantic salmon. Atlantic salmon restoration will provide a high-quality fishery for eight to twelve pound sea-run salmon that will generate an estimated 30,000 hours of recreational fishing on both the Farmington and Salmon Rivers and enhance local economies.

## Archaeological Review

A review of the State of Connecticut Archaeological Site files and maps show no known archaeological site in the project area. Field review indicates that topographic and environmental features of the project area suggest a moderate to high sensitivity toward undiscovered archaeological resources.

While our knowledge of archaeological sites on the project area is limited, the area does possess structural and landscape patterns that can be used to provide an understanding of past cultural use of the land. For example, stonewalls provide a glimpse of the historical use of the project area associated with Colonial and 19th century farming activities. In addition, elevated knolls over the wetland systems are very likely to contain prehistoric Native American sites. Unfortunately, due to the invisible nature of most archaeological sites, we would not be able to identify the specifics of these sites without excavation. Nonetheless, landscapes along the trail can be interpreted in relation to past Native American lifeways. In addition we would recommend that the school contact the Marlborough Historical Society for any information about the property.

The Office of State Archaeology and the State Historic Preservation Office are prepared to offer the town of Marlborough any technical assistance in identifying any cultural resources along the existing and proposed nature trail. We believe that these resources may offer important educational opportunities for the community to learn about past cultural adaptations and historic land use.

## Appendix

Air Photos  
1995

Wetland Soils Map

National Wetland Inventory Classifications Map

Soils Limitations - Recreation

Non-technical Soils Descriptions

Wildlife Habitat Series

Daylighting Roads and trails to Create Edge

Brush Piles for Wildlife

Butterfly Gardens

Please contact the ERT Office for Appendix Information  
At 860-345-3977

# **ABOUT THE TEAM**

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

**The services of the Team are available as a public service  
at no cost to Connecticut towns.**

## **PURPOSE OF THE TEAM**

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

## **REQUESTING A REVIEW**

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Soil and Water Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.