

Boulder Knoll Property NRI Cheshire, Connecticut



King's Mark Environmental Review Team Report

King's Mark RC&D Area, Inc.

**Boulder Knoll Property
Natural Resource Inventory**

Cheshire, Connecticut



Environmental Review Team Report

**Prepared by the
King's Mark Environmental Review Team**

Of the

**King's Mark
Resource Conservation and Development Area, Inc.**

**For the
Town Council
Cheshire, Connecticut**

December 2007

Report #345

Acknowledgments

This report is an outgrowth of a request from the Cheshire Town Council to the Southwest Conservation District (SWCD) and the King's Mark Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the King's Mark Environmental Review Team (ERT).

The King's Mark 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 Thursday, May 24, 2007.

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I would also like to thank Michael Milone, town manager, Bill Voelker, town planner, Suzanne Simone, environmental planner, Diane Visconti, council member, Kerry Deegan and the Friends of Boulder Knoll, Inc. 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 various maps and a copy of the town's management plan (6/28/05), and conservation easement agreement. During the field review Team members were given additional information such as a trail map, open space maps and a Phase 1 environmental assessment. After the field review it was decided to have all the Team members receive a copy of the Friends of Boulder Knoll, Inc.'s proposal for management and the Deegan proposal that were received in response to the town's Request for Proposal (RFP#0607-03). Some Team members conducted a map review only. 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. This report identifies the existing resource base and evaluates its significance to the proposed use, and also suggests considerations that should be of concern to the town. The results

of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The King's Mark RC&D Executive Council hopes you will find this report of value and assistance in the review of this town owned property..

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Introduction

The Cheshire Town Council has requested assistance from the King's Mark Environmental Review Team (ERT) in conducting a natural resource inventory and review of the Town Council's management plan for the town owned Boulder Knoll Property, and two proposals submitted for use of a portion of the property.

The 150.53 acre Boulder Knoll Property (mostly a former dairy farm) was made up of three separate parcels, the Lassen Farm, the Jackman Farm and the Blauvelt Property. The Boulder Knoll Property is the largest open space property on the eastern border of Cheshire and Wallingford. It is located on the north and south sides of Boulder Road. The 35.23 Jackman Farm includes one house and some storage buildings, the 93.5 acre Lassen Farm (includes farm buildings and homes) was a dairy operation from the early part of the 20th century until March 2000 and the Blauvelt Property was formerly leased by the Lassen Farm to grow silage. While the three properties were acquired separately by the Town, their contiguous nature and common features lend well to them being managed under a single management plan. Boulder Knoll is a major link in the town's long range plan to create a "greenbelt" along eastern Cheshire, essentially parallel to the Cheshire-Wallingford border.

Objectives

The Cheshire Town Council adopted the Boulder Knoll Management Plan (see Appendix) in June 2005. This plan indicated general use of the specific areas of the property. The town is interested in a natural resource inventory and review of this plan to supplement their information and to suggest suitable land uses for the property while maintaining public access. The Town may look to expand the use of the property and is seeking assistance in determining which activities best suit the site and are within the context of the State of Connecticut Conservation Easement (see Appendix).

After the ERT Team's field review the town additionally requested that Team members review and comment on two proposals received when the town issued an RFP for use of the Lassen portion of Boulder Knoll ("Boulder Knoll Community Farm – Proposal for Management and Multi-Purpose Use" submitted by the Friends of Boulder Knoll, Inc. and a proposal submitted by Kerry M. Deegan).

The ERT Process

Through the efforts of the Cheshire Town Council, this environmental review and report was prepared for the Town of Cheshire.

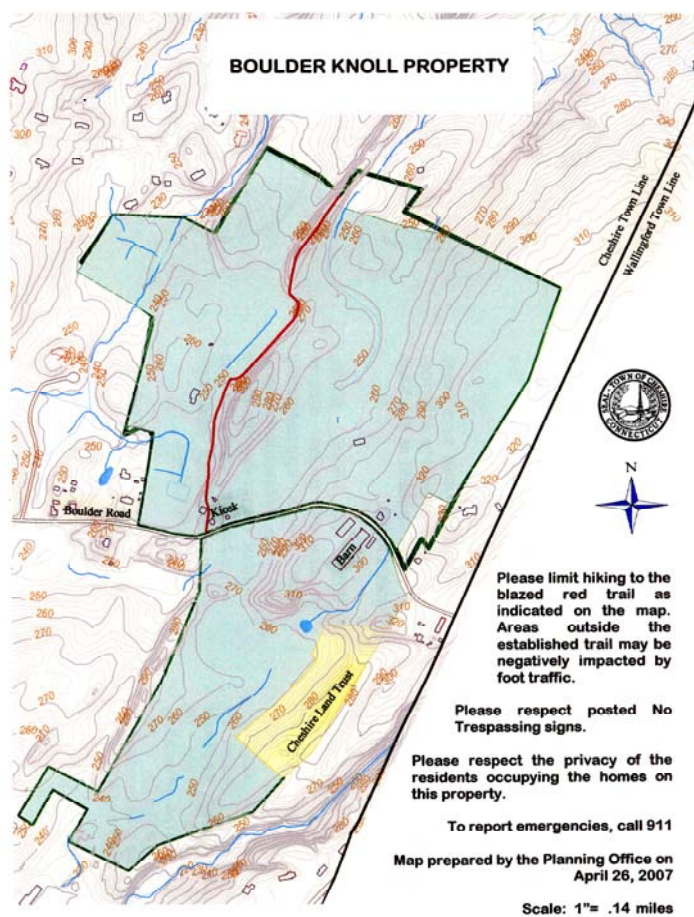
This report provides a natural resource inventory and a series of recommendations and guidelines which cover the topics requested by the Council. Team members were able to review maps, plans and supporting documentation provided by the town.

The review process consisted of four phases:

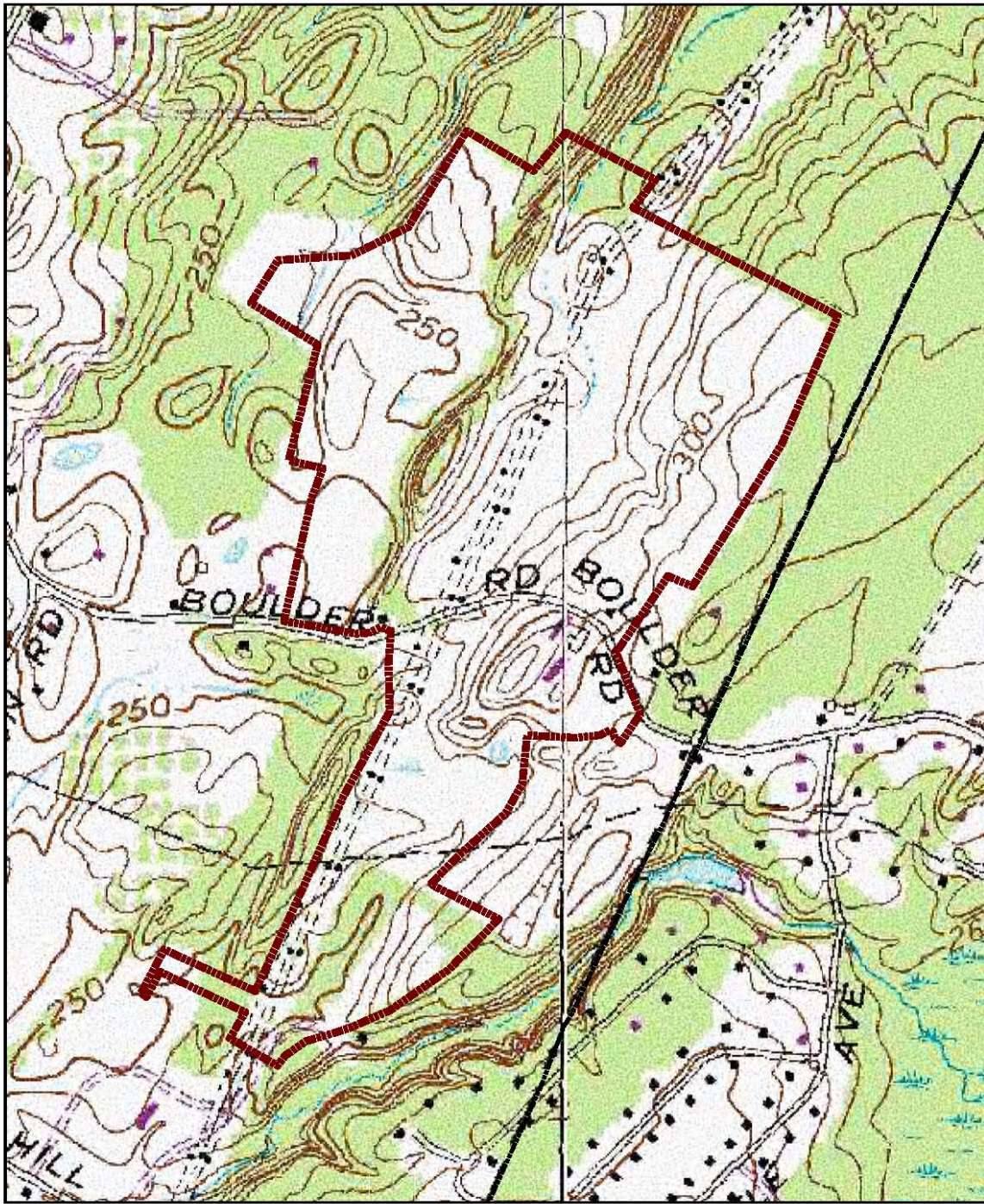
1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted on Thursday, May 24, 2007. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Some Team members made separate and/or additional site visits. The field review 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.

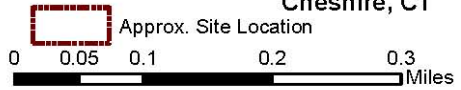


Boulder Knoll Natural Resource Inventory Site Map



The Connecticut Environmental
Review Team

This map was prepared by Amanda Fargo-Johnson for
the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
December 2007.



Cheshire, CT

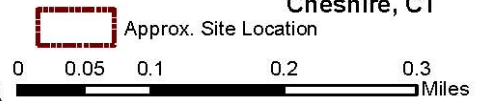
Approx. Site Location

Boulder Knoll Natural Resource Inventory Aerial Map



The Connecticut Environmental
Review Team

This map was prepared by Amanda Fargo-Johnson for
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This map is for educational use only.
It contains no authoritative data.
December 2007.



Cheshire, CT

Geology

Bedrock Geology

Cheshire lies on the western side of the central valley of Connecticut. The central valley is underlain by Mesozoic (248 to 65 million years ago) sedimentary and igneous rocks. Most of the Boulder Knoll Property is underlain by rocks of the New Haven Arkose (Figure 1). This formation is composed of lithified (conversion into solid rock) alluvial deposits that formed during the Triassic period of geologic time. During the Triassic (about 225-200 million years ago) period this area was part of a long valley that had highlands to the east. Streams and rivers headed in the highlands, eroding the local bedrock. The rivers then flowed out into the valley, carrying the eroded materials as bedload. Sand and gravel were deposited from the rivers when they spread out into the valley. Fine sand and silt formed flood plain deposits on top of the sand and gravel. These later hardened into sandstone and pebbly sandstone found on the property. The sandstone beds are grayish-red, reddish-brown, and brown and are locally called brownstone (Figure 2). They are the same general type of sandstone that has been quarried for more than 100 years in Portland, CT. They are, however, older than the rocks at Portland and not as well cemented. The sedimentary sandstones are poorly exposed on the Boulder Knoll Property; the only outcrop of sandstone was found in what remains of an exploratory mine shaft located at the western border of the property at what is called "Cross-rocks" (Figure 3). Here the rock was exposed by excavation.

The sedimentary rocks were intruded twice by molten igneous rock (magma) of basalt composition. During early Jurassic time, magma rose through fractures in the sand and gravel forming veins or dikes. The magma solidified to rock upon cooling. Two sets of dikes intersect along the western side of the property. The older dike-set trends roughly east-west and is composed of the West Rock diabase (Fritts, 1963). It crops out just south of Boulder Road. The younger set of dikes trends roughly north-south and is composed of the Buttress diabase (Fritts, 1963). It forms the hills along the western border of the property south of Boulder Road and extends up the western half of the property north of Boulder Road. The rocks consist of diabase which is an igneous rock of basaltic composition and having a medium-grained texture. There are slight chemical differences between the two diabases. The older one contains slightly more titanium (a minor element) than the younger one. The two dikes are part of the system of feeder dikes for the lava flows that filled the valley in Jurassic time. In addition, the older dike set fed into the igneous bodies that today form The Sleeping Giant just south of Cheshire and West Rock in New Haven. The eroded edges of the lava flows form the trap-rock ridges that extend from East Haven north into Massachusetts. They include Meriden Mountain and Talcott Mountain among others.

The diabase is slightly more resistant to glacial erosion than the sedimentary rocks and hence they stand up in relief (Figure 4), forming a crossing ridge system on this property. They form outcrops along a line of low hills that have a maximum of 50 feet of local relief.

19th Century Barite Mining

During the mid 1800's mining and extraction of the mineral barite, barium sulfate, was a lively industry in Cheshire (Fritts, 1962). The mineral is white and was used to pigment paint. In addition to barite, small amounts of copper sulfide minerals were found. The main barite mines are west of the property along east –west fracture and fault zones. At Boulder Knoll prospect pits were dug (Figure 5) and a mine shaft excavated (see figure 3) along part of the younger basalt dike. Fritts suggests that copper rather than barite was the object of these prospects. Although no ore minerals were seen on the surface during the ERT field excursion, it is possible that some could be found in the waste piles adjacent to the prospects.

Surficial Geology

The effects of the last ice age are not spectacular at Boulder Knoll. Ice, up to a mile in thickness covered the area about 20,000 years ago. Ice in this area the ice moved southward and as it did it eroded the rock beneath. Because sandstone is relatively “softer” than basalt, areas underlain by sandstone were eroded more by the glacier. This left areas underlain by basalt standing higher and formed the hills of the area. Where the glacier overrode the older basalt dikes (east-west oriented dikes) it more aggressively eroded the sandstone and basalt and created steep south-facing slopes. This likely was caused by the process of glacial plucking.

Relatively thin till covers most of the area (Flint, 1962). No specific exposures of till were observed during the field excursion; the soils may be presumed to be of glacial origin. Several large erratics (an erratic is a boulder transported and deposited by a glacier having a lithology different than the material upon which it is sitting) were part of the till near the cross-rocks area (Figure 6). A small deposit of sand and gravel was mapped by Flint (1962) just west of the Buttress Dike near the northern boundary of the property.

References

Flint, R.F., 1962, The Surficial Geology of the Mount Carmel Quadrangle, CT Geol. and Nat. Hist Surv. Quad. Rpt. #12, 25p.

Fritts, C.E., 1962, The Barite Mines of Cheshire. Cheshire Historical Soc., 36 p.

Fritts, C.E., 1963, Bedrock geology of the Mount Carmel Quadrangle, Connecticut. U.S. Geol. Surv. Quadrangle Map #GQ-199.

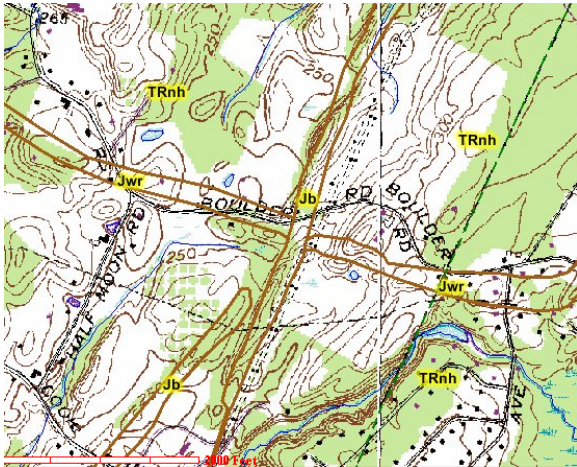


Figure 1. Geologic map of the area surrounding and including Boulder Knoll.

Jb = Buttress Diabase

Jwr = West Rock Diabase

TRnh = New Haven Arkose



Figure 2. Grayish red conglomeratic sandstone fragment in glacial soil along red trail. Black pen is approximately 5 inches long.



Figure 3. Intersection of diabase dike (right two-thirds of picture) with conglomeratic sandstone at filled in shaft near cross-rocks. Contact is steeply dipping (slanted) toward east (left). Sandstone beds dip less steeply eastward. Shaft was sunk while prospecting for copper (Fritts, 1962). Shaft is filled with soil and appears inaccessible.



Figure 4. Basalt dikes stand in relief forming local hills where they outcrop. Picture on left shows older (West Rock diabase) dike, looking east. Picture on right shows younger dike (Buttress diabase) dike, looking north.



Figure 5. Trenches and prospect pits along ridge formed by Buttress dike. Location 500-750' north of Boulder Road. Apparently the object of the exploration was copper. Fritts (1962) speculates that excavation may have been more for stock promotion than for mineral exploration.



Figure 6. Glacial erratics seen in the vicinity of cross-rocks.

Soils Resources

The information in this section of the report is based on the USDA's historical soils series descriptions and the new digital mapping unit descriptions as presented in the Soil Survey of Connecticut, remote survey interpretations plus field observations.

The sites drainage pattern is split between two watersheds.

The historical reference for soils regarding this region can be found in sheet number 29 of the 1979 New Haven County Survey. The soils data provided in Appendix A of the *Boulder Knoll Community Farm – Proposal for Management and Multipurpose Use* prepared by the Friends of Boulder Knoll, Inc. report adequately identifies, inventories and provides the ratings of the farmland classifications of the soil resources on site. This soils report provides additional historical information on specific parcels on site, which were delineated and assessed for their potential limiting attributes and optimal uses. See Exhibit #1 Map which follows.

Boulder Knoll Community Farm Proposal, Appendix A, Page 1 & 2

Area 1 is dominated by “prime farmland and farmland of importance.” In Exhibit #1, prior (1970) use determinations by USDA / SCS (now NRCS) provide information on crop suitability and the severe erosion hazard associated with disturbing these parcels. Approximately 9.0-acres of the west side of Area 1 are designated as “HEL” (Highly Erodible Land) along with another 4.8-acre of land contiguous with Area 1 trending south along the slope and forest edge.

Area 4 located in the southwest corner of the parcel is approximately 4.1-acres in size, which has the same soil attributes and concerns as the aforementioned Area 1.

Highly Erodible Land (HEL)

Exhibit #1 shows portions of the farm fields designated as "HEL" (Highly Erodible Land) by the United States Department of Agriculture / NRCS. This means that these lands were at one time used to produce corn crop and not just hay. Corn production would mean that these soils were subjected to yearly disturbances and subsequent compaction of the subsoil. This use coupled with soil type and slope gives rise to a dense basal layer that can perch water tables or hold water in the soils for longer periods of time, which increases the erosion hazard of that specific portion of the site.

- **Severe Erosion Hazard** - Land disturbances on “C” slopes and these particular soil types present a severe erosion hazard. They have been classified as “HEL” due to its soil type and steep slopes (“C” **slope designation of 8 to 15 percent**). The preferred crop use for these types of soils with these designations and attributes is a hay crop, which dramatically reduces the erosion hazard and the potential to adversely affect water quality within the watershed subbasin and public water-supply areas.

- 47% of the parcel contains soils that are regarded as prime farmland (LpA & B, Eh CsB & YaB) or farmland of statewide importance (Raynham & YaC). Prime farmland has the best combination of physical and chemical properties for the production of food and fiber crops and is available for such uses, additional land of statewide importance is only slightly less suited to crop production, but could produce yields similar to those of prime farmland if conditions are favorable.
- Until recently, prior cooperator records indicate that the property has over the years been managed in such a fashion as to help sustain soil productivity for the future.
- Demand for productive agricultural land far exceeds the available supply.
- There are several federal programs such as WHIP & EQIP that may be able to assist the town in establishing sound leasing agreements, best management practices and facilitate long-range planning and/or preservation of this property.

Recommendation

Guidance on the appropriate agricultural use of this land and long-range conservation plans can be developed and obtained through the USDA / NRCS Service Center office located at 900 Northrop Road, Suite A in Wallingford, CT. Jack Lassen (Farmer) was a registered cooperator with the Department of Agriculture where many of the assessments and evaluations were issued. The historical data on this farm can also provide a comprehensive conservation plan that optimizes land use and addresses sediment and erosion control on and off-site. These determinations would facilitate future land use decisions in developing lease agreements with community gardening groups or commercial farming plus any potential active or passive uses entertained by the town.

Watersheds / Subbasin Drainage

This property drainage pattern are split between two watersheds, south of Boulder Road the subbasin drainage flows into the subregional drainage basin (HUA 5302) of the Mill River and a source of water supply to the Regional Water Authority and north of the roadway the land drains to the subregional drainage basin (HUA 5204) of Broad Brook, which is contributory to the Meriden Water supply system.

- Surface Water Classifications range from GAA (not meeting current standards) north of Boulder Road to BAA (meeting current standards) south of the roadway. Proposed activities for this property should address the cumulative impact of numerous activities within a given watershed, which may affect water quality.
- Given the sites classifications for water quality in this area and the sites proximity to the headwater's of the Mill River and Broad Brook systems, it is of the utmost importance to protect the site from direct and indirect land uses that might adversely affect water quality.

- Best Management Practices (BMP's) to minimize NPS (nonpoint source) contamination from pesticides, herbicides and fertilizer applications are recommended. The fact that the majority of this land has been fallow for several years broadens the opportunities for community gardening, high quality organic farming and commercial growing of a diverse and ever emerging niche in our agricultural base in south central Connecticut. The Friends of Boulder Knoll Farm have adequately addressed and proposed an array of agricultural opportunities and BMP's for implementation on these properties.

The University of Connecticut Cooperative Extension System can lend a great deal of expertise in developing an Integrated Crop (ICM) and Pest Management (IPM) Program, which are designed to educate farmers in a variety of fertilizer and pest control methods that are designed to protect public health and the environment. These programs are well established and have a proven track record of increasing crop productivity and quality.

ICM & IPM practices should be used whether the site is leased by commercial growers or used as a community gardening, which can serve to educate other farmers and private growers in the region.

Wetland Resources

The watercourses, wet meadows, ponds and wetland systems onsite are extensive. They contribute to the renovation of raw water quality introduced to the headwaters of Broad Brook and Mill River Watersheds.

Best Management Practices for agriculture should be applied that will restore impacted wetlands and preserve their value and function.

Recommendation

- Agricultural use of the land has the potential to increase nutrient loading, which can adversely affect water quality. The protection and maintenance of these wetland systems are critical in sequestering contaminants and the up-take of nutrients.
- Establish a 100-foot buffer around the mapped wetlands.

Land Use Planning Opportunities

The property needs to have a long-term natural resource conservation / agricultural management plan, which encompasses goals and objectives for increasing and maintaining biodiversity, integrates year round passive recreational uses that can provide a platform for education that showcases and preserves our rich farming heritage, provides public access, serves the citizenry of the town while advocating for all environs on and abutting this site.

- The creation of a diverse habitat and sanctuary on this site could be used as an outdoor living classroom / laboratory. This would expand and enhance all grade level science based

curriculums in the Cheshire school system. This could involve local schools, colleges and interested non-profits.

- Consideration should be given to preserving and refurbishing the barn and out buildings for potential meeting places, farm equipment storage, agricultural museum and on-site laboratory for soil and water testing or possibly used as a seasonal country fair setting that showcases all aspects of the properties natural attributes and multifaceted uses.
- Establish a trail system guided by the protection and preservation of critical habitats, promotes the minimization land disturbance, which ultimately reduces potential impacts from erosion and siltation of sensitive habitats from agricultural and recreation activities.

Federal Administered Programs

- **USDA / NRCS - Programs**

EQIP = Environmental Quality Incentives Program: Farming Entities (Commercial or Private) under lease agreements with the Town would be eligible to participate in the program for the implementation of BMPs and development of sound conservation plans designed to assist in erosion and sedimentation control, nutrient loading, reducing water consumption and the selection of appropriate crops suited to site specific soils and topographic characteristics.

- **WHIP = Wildlife Habitat Incentive Program:** Municipalities and Private Landowners are eligible to participate in a cost-share program for landowners to implement practices to maintain or establish wildlife habitats. These practices include invasive plant control, early successional woodlands, riparian areas; state identified imperiled habitats plus streams and rivers.
- **WRP = Wetlands Reserve Program:** This program helps landowners to protect, restore and enhance wetlands.

The development of a comprehensive land use management plan for this property will greatly ensure the protection and preservation of the areas water quality, wildlife habitat enhancement and provide open space access to the community to view diverse vistas, observe and / or participate in farming activities, learn about best management practices and promote greater environmental awareness.

A similar scenario to Boulder Knoll Farm came about in 1997 in the Town of Madison where the town received Bauer Farm as a gift from the Bauer family. Though there are slight differences in the acquisition of the property, the diversity of natural resources are the same and the proposed scope of uses by the community are for the most part the same. The Town of Madison utilizes the site for commercial and organic community gardening, forestry research, environmental education component to its school curriculum, year round passive recreation and an agricultural museum dedicated to preserving their diminishing farming heritage. (See Appendix for a description of Bauer Park.) It would be prudent for the Town of Cheshire to observe the components of this municipal project and see first hand what aspects of Madison's land use management plan might work for the Town of Cheshire and its Citizens.



A Watershed Perspective

Opening Remarks

These recommendations to the Town of Cheshire are given from the perspective of improving water quality and maintaining and supporting designated uses of the waters of the State in accordance with Connecticut's Water Quality Standards¹. These recommendations also reflect the Department of Environmental Protection's (DEP) growing commitment to address water quality concerns from a watershed perspective, taking into account the cumulative impact of numerous activities within a given watershed that may affect water quality.

Watersheds are natural drainage divides that vary in size from drainage for backyard ponds to headwaters and tributaries of lakes and rivers. It is an easily identifiable landscape unit that ties together terrestrial, aquatic, geologic, and atmospheric processes. Land use planning at the watershed scale is an effective way to guide future development so as to minimize impact on both water quality and natural resources; direct available technical and financial resources to restoration and enhancement needs; facilitate partnerships to promote land and water resource stewardship; and develop actions to measure progress. Management decisions involving river resources must be made comprehensively and from an overall basin perspective. Integrated water use, water quality, land use data, and the instream biotic resource and habitat needs must be considered in river management decisions.²

As an additional consideration, choosing innovative approaches which minimize land disturbance and preserve natural buffers and open space (like cluster housing) not only minimize nonpoint source pollution and protect the environment, but also reduce infrastructure costs while affording neighborhoods opportunities to stay connected with their environment. In this new age of "Smart Growth", greenways, environmental equity, and better land use planning, it is incumbent upon all towns to consider and address all of the impacts associated with new development.

Proposal

The Town of Cheshire acquired three adjoining parcels comprising 150.53 acres of predominately former dairy farm. The site is located along the eastern town boundary, bifurcated by Boulder Road. The Town is interested in a management plan for the entire parcel, keeping in-kind with its past agricultural uses. The property is also a major link to the town's long-range plan to create a greenbelt. Both of these uses can coexist.

¹ State of Connecticut, Department of Environmental Protection. Effective 1996 & 2002. Water Quality Standards. Bureau of Water Management – Planning and Standards Division. Hartford, CT.

² State of Connecticut, Office of Policy and Management. 2005. Conservation and Development Policies Plan for Connecticut 2005-2010. Intergovernmental Policy Division. Hartford, CT.

Drainage Basin

The subject parcel falls between two natural drainage basins or watersheds. This is the land area that drains to a common receiving water body such as a stream, lake or wetlands. Roughly, the northern portion of the property falls within the Broad Brook subregional watershed (drainage basin number 5204) located within the larger Quinnipiac Regional Basin, while the southern portion of the property flows to the Mill River subregional watershed (drainage basin number 5302) within the Mill River Regional Basin; the property being split along a major drainage divide.

Water Quality Classification

In the northwestern corner of the property are the headwaters of Broad Brook, a Class AA stream that feeds the Broad Brook public water supply reservoir. Further east is a small, unnamed perennial stream that flows into Broad Brook north of the site, also Class AA. Class AA designated uses are: existing and proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture.

The ground water classification for the area is Class GAA. Designated uses for Class GAA are: existing or potential public supply of water suitable for drinking without treatment; base flow for hydraulically connected surface water bodies.

Additionally, the property lies within two public water supply watersheds: Broad Brook Reservoir to the north operated by the Meriden Water Department, and the Mill River System's Lake Whitney to the south operated by the South Central Connecticut Regional Water Authority. The site also lies between the groundwater source area for Gaylord Hospital's community well #1 to the east, and the public water supply aquifer for the SCCRWA's South Cheshire Wellfield to the west.

As a consequence of the surface and ground waters being extremely high quality, it is tremendously important that precautions and Best Management Practices (BMPs) be taken to protect the streams and groundwater quality. Any proposed development merits added consideration of available, practical measures that may be taken to ensure the protection of these resources from development-related impacts and nonpoint source pollution – a growing nationwide concern.

Proposed Agricultural Use

Given the area's high water quality classification and the property's proximity to the headwaters of Broad Brook and the Lake Whitney Reservoir systems, it is of the utmost importance to protect the area from direct and indirect development impacts that might adversely affect water quality. Obviously, the current proposal to keep this site as open space greatly reduces the potential threats typically associated with land development; i.e. clearing and grubbing, grading, sedimentation and soil erosion, stormwater collection, etc. However, Best Management Practices are still recommended to minimize nonpoint source pollution. Examples are: pervious

parking areas, curbsless roads with reduced widths, vegetated drainage swales, maintaining land cover, and removing debris and litter from drainage ways.

The preservation of this property will greatly ensure the protection and preservation of the area's water quality, existing wildlife habitat, and open space while providing local residents with new opportunities to observe and/or participate in farming activities, learn more about Best Management Practices and additional environmental management techniques, and simply to enjoy the outdoors.

If plans for the property include growing crops, community gardens, or livestock, it may be prudent to contact the USDA Natural Resources Conservation Service for assistance to ensure minimal impacts to ground and surface water quality. They can provide guidance on soil conservation and tillage practices, and housing of farm animals and manure handling to avoid and minimize contact with stormwater runoff. For more information, contact USDA – NRCS Wallingford Service Center, North Farms Executive Park, 900 Northrop Road, Suite A, Wallingford, CT 06492, or call Tom Ladny at (203) 269-7509, e-mail: Tom.Ladny@ct.usda.gov.

In addition to minimizing land/soil disturbances and promoting stormwater retention and infiltration, it is important to follow Best Management Practices for herbicide, pesticide, and fertilizer applications, should the property be used as an active farm or converted to a community garden. This also presents an excellent opportunity to demonstrate Integrated Pest Management (IPM) and Integrated Crop Management (ICM) practices. These programs, sponsored by the University of Connecticut Cooperative Extension System, are designed to educate farmers in the use of a variety of pest control methods and fertilizer techniques to protect public health and the environment, and to produce high quality crops and other commodities with the most judicious use of pesticides and fertilizers. For more information, contact Ana Legrand, Ph.D., IPM Coordinator, Department of Plant Science, University of Connecticut, 1376 Storrs Rd., Unit 4067, Storrs, CT, 06269, or call (860) 486-0869, e-mail: Ana.Legrand@uconn.edu.

Should the Town of Cheshire need assistance in managing an agricultural operation at the property, it may be eligible to apply for a grant under the Environmental Quality Incentives Program (EQIP). This is a voluntary conservation program from the USDA Natural Resources Conservation Service that provides cost sharing and incentive payments to implement conservation practices on eligible agricultural land to promote environmental quality and agricultural production as compatible goals. Through EQIP, farmers may receive financial and technical help with structural and management conservation practices - up to 75 percent of the costs of eligible conservation practices. Incentive payments may also be made to encourage farmers to adopt land management practices, such as nutrient management, waste utilization, integrated pest management, irrigation water management, and wildlife habitat management. For more information, go to <http://www.ct.nrcs.usda.gov/programs/eqip/eqip.html>.

Habitat Restoration/Enhancement

Besides continuing or restoring farming activities at the property, the site may lend itself to other beneficial uses, such as habitat restoration or enhancement. For example, depending on the state

of vegetative succession of the existing farm fields, managing these or adopting farming techniques that preserve or enhance habitat for other animal species, especially birds, may be extremely desirable.

DEP Connecticut's Landowner Incentive Program (LIP) is a new program geared towards larger scale projects to provide useable habitat for at-risk species. The LIP grant program requires that proposals either: 1) restore, create, improve and maintain priority habitats or imperiled natural communities that are a benefit to LIP at-risk species, or 2) directly manage and protect LIP at-risk species. This program made possible through grants from the U.S. Fish and Wildlife Service, is designed to provide technical advice and cost assistance to landowners for habitat management that will result in the protection, restoration, reclamation, enhancement, and maintenance of habitats that support fish, wildlife and plant species considered at risk. Private property owners may apply for up to 75% of the project cost, up to a maximum of \$25,000 with at least 25% of the project cost to be provided by a nonfederal source, possibly including in-kind services. A smaller group of grant awards of up to \$5,000 may also be available. The application deadline is **October 31, 2007**. For more information, go to http://www.ct.gov/dep/cwp/view.asp?a=2723&q=325734&depNav_GID=1655.

Another USDA Natural Resources Conservation Service program is the Wildlife Habitat Incentives Program (WHIP). This is a voluntary program for landowners who want to develop and improve wildlife habitat primarily on private land. Through WHIP USDA's Natural Resources Conservation Service provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed. For more information, go to <http://www.nrcs.usda.gov/programs/whip/>.

There are other activities that may dually serve as local demonstration projects that may not only improve fish and wildlife habitat but also serve to protect water quality. For example, it appears from aerial photography that the unnamed perennial stream in the north central portion of the property may have been channelized in the past. The town may consider restoring or enhancing the ditched channel to a more natural-looking stream using a hydraulically engineered design and appropriate bank stabilization techniques, including biotechniques (also know as "soft-armoring") by installing vegetative plantings or other non-structural materials (instead of rip rap rock) to stabilize eroded stream banks and create or improve fish and wildlife habitat.

Another environmental enhancement is the planting of native trees, shrubs and herbacious plants to illustrate natural landscaping techniques that would benefit wildlife without introducing possibly invasive ornamentals.

Buffers

The riparian corridor is the area adjacent to a watercourse, typically containing wetlands, that acts as a buffer to the watercourse. Leaving a vegetated strip around surface water resources, including wetlands helps protect surface and groundwater quality, and fish and wildlife habitats from nonpoint source pollution. Buffers trap road sands, contaminants and other pollutants contained in stormwater runoff generated from roadways, parking lots, roof tops, and other

impervious surfaces, as well as eroded sediments occurring from natural scour or land moving activities such as site development and other soil disturbances, including farming activities. A 50 foot vegetated buffer is typical, but widths can vary depending on such factors as topography, the erosivity of the soil, and the value or sensitivity of the water resource.

In addition to the benefits described above, riparian buffers help moderate the temperature of stormwater runoff before it enters the watercourse, thereby reducing thermal impacts on aquatic wildlife. Riparian wetlands may additionally provide valuable wildlife habitat, flood attenuation, water quality renovation, and groundwater recharge, so it is important to protect these areas from degradation.

The DEP supports and recommends the use of buffers to protect wetlands and watercourses from environmental impacts. To protect riparian buffers from noise, human encroachment, and other development impacts, including stormwater runoff, the CT DEP Fisheries Division recommends a 100-foot buffer zone along perennial streams, and a 50-foot buffer zone along intermittent streams³ measured from the outer edge of any riparian wetlands. DEP Fisheries further recommends that this buffer zone remain in a naturally vegetated and undisturbed condition. If existing buffers at the site do not meet these criteria, consider providing native plantings to enhance or extend the buffer zones and/or adopting a no-mow zone to allow these areas to revegetate naturally. The USDA Natural Resources Conservation Service also has developed guidelines for planning and installing riparian buffers. For more information, contact USDA – NRCS Wallingford Service Center, North Farms Executive Park, 900 Northrop Road, Suite A, Wallingford, CT 06492, or call Tom Ladny at (203) 269-7509, e-mail: Tom.Ladny@ct.usda.gov.

Open Space

Often existing beyond riparian corridors are wildlife corridors. These are typically wide, linear tracts of land that allow wildlife to move freely between natural habitats containing both wetlands and uplands. As land becomes developed, roadways often segment these corridors resulting in wildlife habitat fragmentation. Efforts to preserve open space help maintain these corridors and can provide valuable “edge” habitat for wildlife, as well as protecting natural resources, preserving scenic landscapes and historical resources, or providing opportunities for recreation or nonmotorized transportation. Open space may also be used to connect existing protected areas and provide access to the outdoors, as has been identified in the Town of Cheshire’s long range plan a greenbelt.

It may be appropriate to construct a trail system that connects the property to other existing and proposed trails, such as the Farmington Canal Heritage Trail located west of Sleeping Giant State Park and the proposed eastern seaboard’s East Coast Greenway, or the Quinnipiac River Linear Trail.

Running the length of the state from New Haven to Suffield, the Farmington Canal Heritage Trail follows the path of the 19th century Farmington Canal. Converted to rail use until 1982,

³ CT DEP Fisheries Division. 1991. Policy Statement – Riparian Corridor Protection; Position Statement – Utilization of 100 Foot Buffer Zones to Protect Riparian Areas in Connecticut.

the corridor was preserved for public use by a coalition of citizens and converted to a recreational path. It has also been officially designated as a Greenway. This is the state's premier trail and preserving its integrity and attributes is important to the state's long-range goals; local and state tourism; and personal fitness.

There is strong scientific evidence that providing access to places for physical activity increases the level of physical activity in a community, which is good for one's health. A trail may be constructed simply for pedestrian access or multiple uses, such as equestrians, bicyclists, roller bladers, baby strollers, joggers/runners, etc. Trail designs vary from at-grade stone dust paths to pavement of various widths and raised boardwalk crossings over wetlands and watercourses or as viewing platforms. The trail design and route must be conducive to the natural terrain. Complementing nature trails with educational kiosks for animal tracks and sign, bird watching, and valuable/grand trees and shrubs, and natural geologic features offer additional attractions that may increase usage by individuals and educational groups.

The next level of corridor protection is the establishment of a greenway. A greenway is a corridor of open space that (1) may protect natural resources, preserve scenic landscape and historical resources or offer opportunities for recreation or nonmotorized transportation, (2) may connect existing protected areas and provide access to the outdoors, (3) may be located along a defining natural feature, such as a waterway, along a man-made corridor, including an unused right-of-way, traditional trail routes or historic barge canals or (4) may be greenspace along a highway or around a village.

If the Town of Cheshire chooses to pursue designation of a greenway, the town needs to carefully consider the types of uses that would be allowed in this area. CT DEP would suggest that opportunities to protect and conserve natural resources values such as water quality, fisheries, wildlife habitat and unique plant communities be considered first. For further guidance on establishing a greenway, the Commission should contact the Connecticut Association of Conservation and Inland Wetlands Commissions (CACIWC), Executive Director Ann Letendre at telephone (860) 896-4731, e-mail "annletendr@aol.com", or CACIWC President Tom O'Dell of the Westbrook Conservation Commission, Westbrook town hall telephone (860) 399-3044; or to reach the Connecticut Greenways Council, contact the DEP Greenways Assistance Center, Laurie Giannotti at telephone (860) 424-3578, e-mail: laurie.giannotti@po.state.ct.us.

Funding may also be available for the design and construction of trails or greenways - see http://www.ct.gov/dep/cwp/view.asp?a=2707&q=323854&depNav_GID=1704&depNav=.

Stormwater Management

Stormwater treatment practices remove pollutants from stormwater through various physical, chemical, and biological mechanisms. Since many pollutants in stormwater runoff are attached to solid particles, treatment practices designed to remove suspended solids from runoff will remove other pollutants as well. Exceptions to this rule include nutrients, which are often in a dissolved form, soluble metals and organics, and extremely fine particulates that can only be removed by treatment practices other than traditional separation methods. It is generally recommended that reducing and treating runoff from all developed sites and reducing the amount

of impervious surfaces, where feasible, is the best way to manage stormwater runoff. By promoting infiltration, the volume is reduced and impacts to water quality and quantity are minimized. Thus, stormwater must be addressed with appropriate Best Management Practices.

The new 2004 Connecticut Stormwater Quality Manual describes both primary treatment practices, which provide demonstrated, acceptable levels of water quality treatment, and secondary treatment practices which are not suitable as stand-alone treatment facilities but can be used for pretreatment or as supplemental practices. The five major categories of primary stormwater treatment practices are:

- Stormwater ponds
- Stormwater wetlands
- Infiltration practices
- Filtering practices
- Water quality swales

Examples of secondary stormwater treatment practices described include traditional practices such as dry detention ponds, vegetated filter strips and level spreaders, oil/particle separators, and deep sump catch basins.

Smaller bioretention areas or “rain gardens” can also be used as a functional landscape element. Rain gardens are shallow depressions that typically include plants and a mulch layer or ground cover; combining shrubs, grasses, and flowering perennials in depressions that allow water to pool for only a few days after a rain (Metropolitan Council, 2001). Pollutant treatment in rain gardens has been attributed to adsorption, decomposition, ion exchange, and volatilization (Prince George's County Bioretention Manual, 2002). The soil absorbs and stores the rainwater and nourishes the garden vegetation. Rain gardens are an effective, low cost method for reducing runoff volume, recharging groundwater, and removing pollutants. These bioretention facilities are most effective if they receive runoff as close as possible to the source and are incorporated throughout the site (Pennsylvania Association of Conservation Districts et al., 1998). A demonstration of these bioretention practices can be viewed at the Glen Brook Green Subdivision, located in the Jordan Brook subwatershed in Waterford, CT, at the UCONN Cooperative Extension System's Haddam office, and the Tolland County Agricultural Center in Vernon, CT. Or see the UCONN Cooperative Extension System, College of Agriculture and Natural Resources brochure, “Rain Gardens in Connecticut: A Design Guide for Homeowners” at http://nemo.uconn.edu/tools/stormwater/pdf/rain_garden_design_guide.pdf.

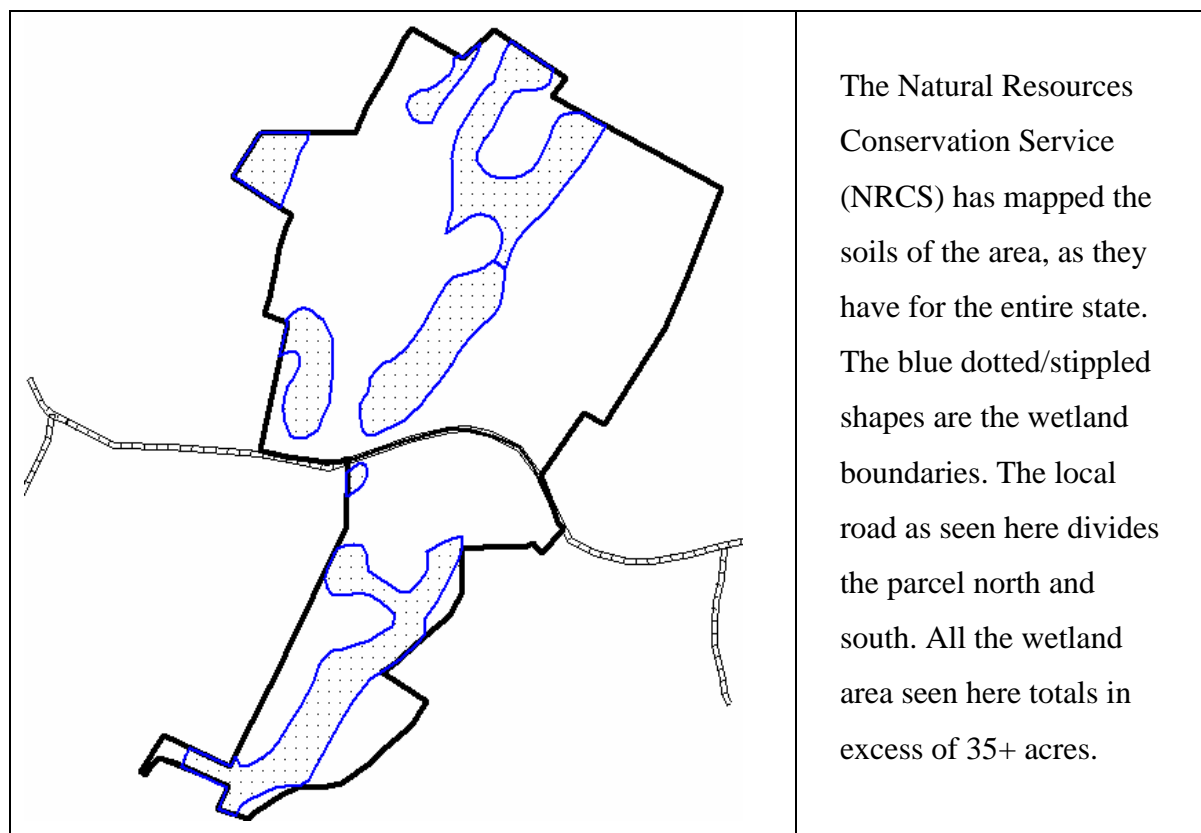
The Stormwater Quality Manual provides guidance on the measures necessary to protect the waters of the state from the adverse impacts of post-construction stormwater runoff. The manual focuses on site planning, source control and pollution prevention, and stormwater treatment practices, and is intended for use as a planning tool and design guidance document by the regulated and regulatory communities involved in stormwater quality management. It also includes innovative and emerging technologies as secondary treatment practices. For more information on how to control stormwater, the Manual is now available on DEP's website at: <http://www.dep.state.ct.us/wtr/stormwater/strmwtrman.htm>.

Alternative uses for the site should be reevaluated for consistency with watershed Best Management Practices and possible permitting requirements.

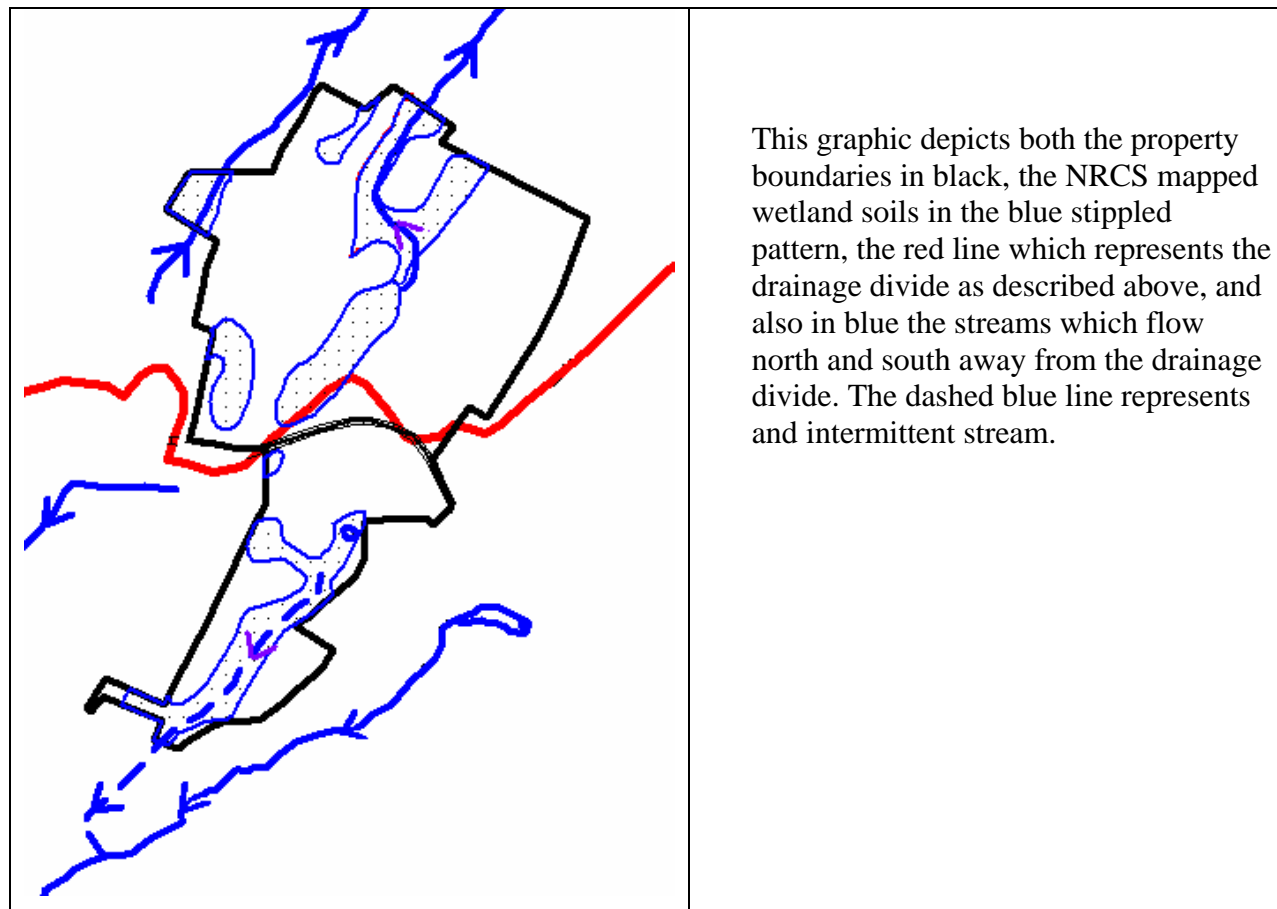
Wetland Resources

The Team found this property to be extremely diverse in its ecological makeup. The area is proposed to remain as municipal open space with the town currently building its knowledge base on the best management practices for the long term.

The property spans ~150 acres. A road divides it northeast and southwest. About 30 per cent sits south of the road while about 70 per cent lies north. The road is also the (approximate) boundary of two drainages. North of the road this property gives rise to one of the main tributaries of Broad Brook. That tributary drains to the north, ultimately into Broad Brook which continues its northerly flow path and empties into the Quinnipiac River at the Cheshire/Meriden boundary. The area south of the road drains to the southwest, ultimately into Mill River drainage which flows south and empties into Long Island Sound in New Haven.



Issues related to the wetlands revolve around the plant communities and drainage patterns altered or eliminated by the years of agricultural use. Currently, hay fields and pasture lie where wetland communities once existed. However, with the general abandonment of agricultural use these once wet areas will have the opportunity to begin their botanical succession.



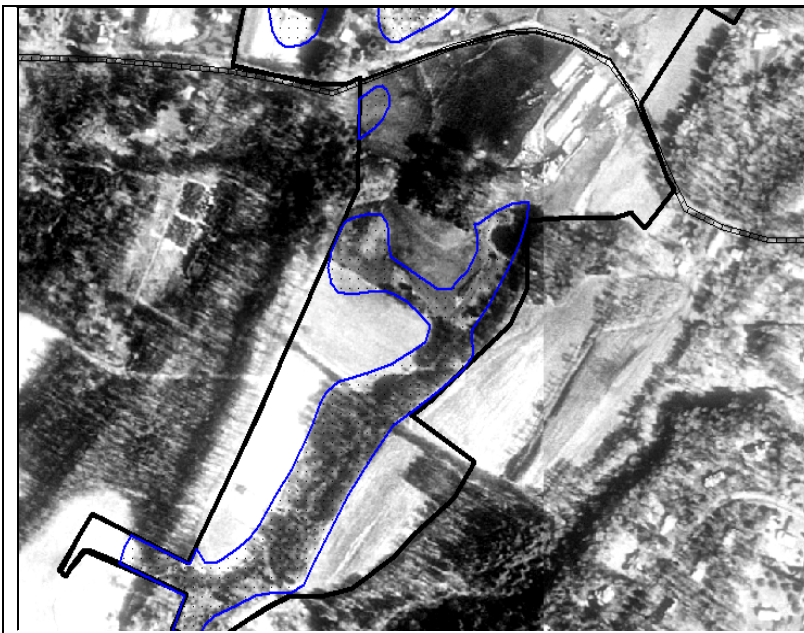
The Wetlands

The most visually apparent wetlands on the property are the pond systems and their runoff streams (as seen below). But on a farm, wetlands have often been so altered that they cannot be recognized since there is no standing water and no plants we recognize as wetland plants. However, in Connecticut, soils define the areal extent of the wetlands, not vegetation. And the wisdom of that is a good example here as the wetland vegetation in many places has been radically altered or totally eliminated by agricultural use.

For example, of the 150 plus acres of property, a total of more than 35 acres is classified as wetlands by the NRCS. That represents nearly 25 percent of the property. There are 23.1 acres of NRCS mapped wetlands north of the road and 12.2 acres south of the road.

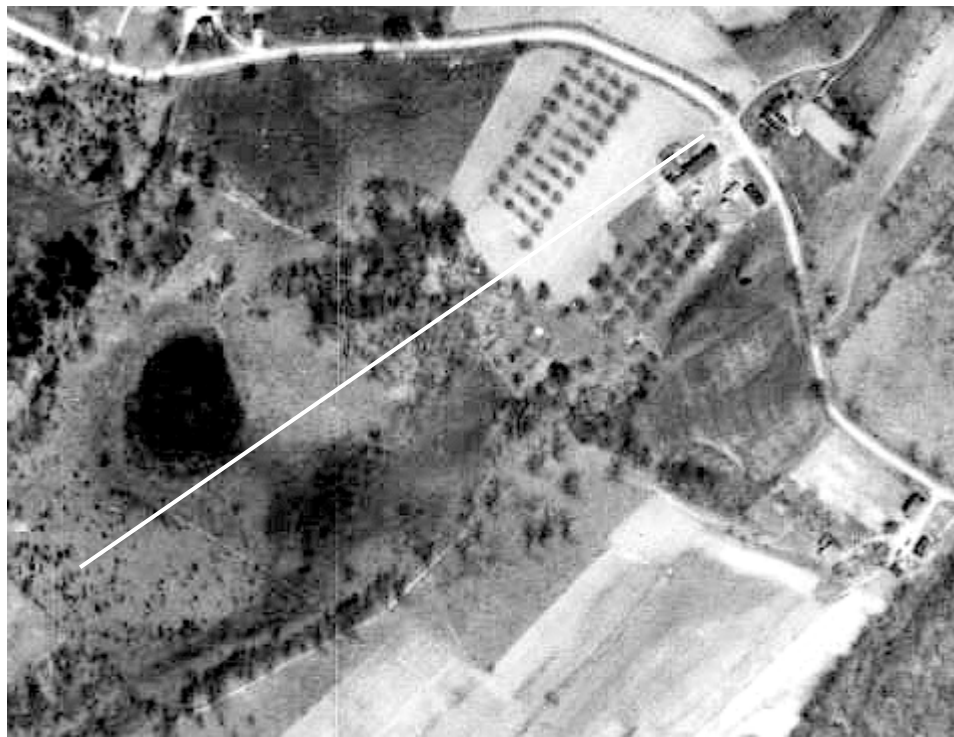


In this section north of Boulder Road (shown on a 1990 photo base) it is apparent that while many wetland acres are left as wetlands, other mapped wetland soils were used for hay or pasture. This is especially apparent in the stippled area north of the oval pond, and in the area in the southwest corner with the rectangular pond.



In the section south of Boulder Road (shown on a 1990 photo base) it is apparent that most all of the areas mapped by the NRCS as wetland soils have been left as wetlands, with the exception of a wet area west of the small pond.

Wetlands suspected of being altered today can easily be contrasted with aerial photographs taken seven decades ago. In Connecticut we are fortunate to have these resources.



1934 Photo Source: Connecticut State Library photo number 04958

These two aerial photographs show the property south of Boulder Road. The top photo was taken in 2004, the lower photo in 1934. Because they are not oriented precisely the same way, white lines parallel to the small roadside building are included for comparison. The once orderly rows of orchard trees have been removed over the 70 years.

The comparison of the photos reveals an interesting history of the wetlands. The small pond the Team visited (the black oval shape to the right of the white line in the top photo) did not exist in 1934. In addition, the team found the going quite wet as we moved west from that pond. Interestingly, the pasture/meadow we found to be wet underfoot turns out to have been a very large springtime open water pond in 1934 (the dark shape seen to the left of the white line in the lower photo on the previous page.)

Of note, and certainly a telling part of the picture, is the fact that the 1934 flight coverage had many portions and gaps re-flown. As luck would have it, the same area depicted above in 1934 was re-photographed later in the spring of that year. The later image (below), revealed by the more abundant “leaf-out” on the deciduous trees, it shows a change - that the ponded wetland drained as the springtime advanced into early summer.



Compare this photo with the lower photo on the previous page. The pond that occurred in early spring has dissipated by this late spring or early summer image. 1934 Photo Source: Connecticut State Library photo number 10079

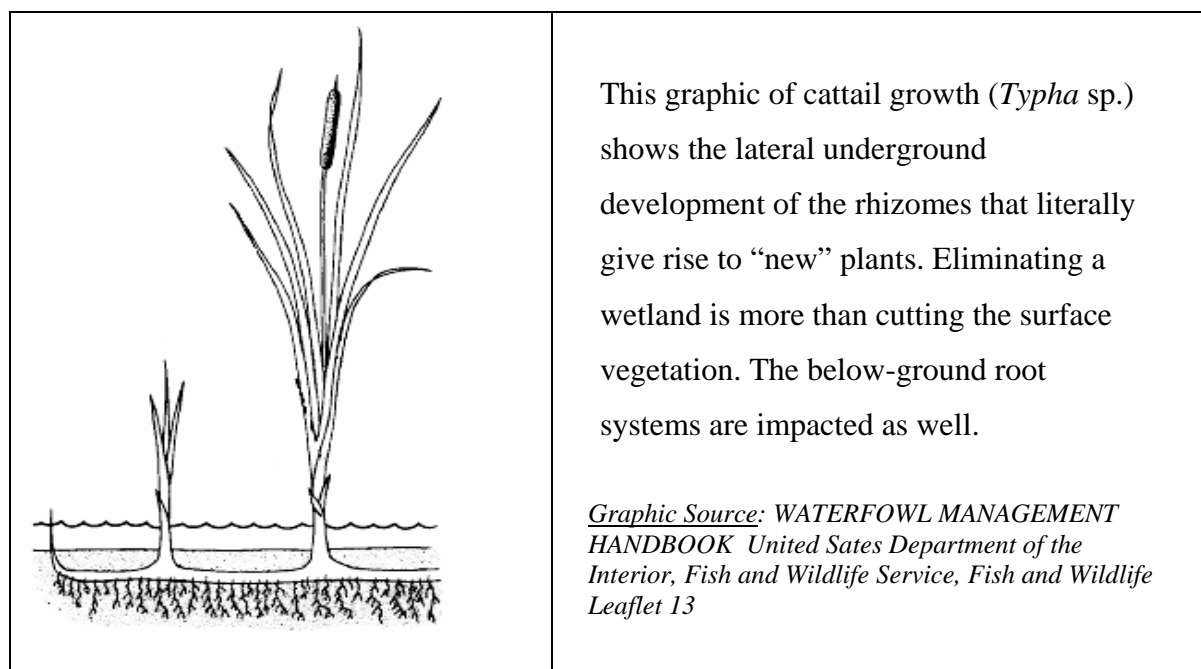
Through the use of the above resources we know there is small scale* wetland mapping available from the NRCS, and through the use of aerial photographs we see that wetlands systems have been altered over time.

** Small scale mapping shows a less detailed large area. Conversely, large scale mapping shows a small area in great detail.*

Wetland Implications and Succession

Compared to wetlands, pasture generally has quite a low value for biodiversity. Compounding the surface vegetation changes from wetland to pasture is the alteration of the soil (the plow layer) due to the combined effects of compaction, disking, plowing and planting. As a result, very nearly all of the root and rhizome systems of the once native vegetation is absent, eliminated through the years. Finally, with the loss of the surface vegetation and the alteration of the vegetative root layer, comes the change in the subsoil bacterial and insect life. Ecological changes can be total.

The process of farm field succession starts with the termination of agricultural use. And in the succession of vegetation, it could be several growing seasons before the “correct” species reestablish themselves. Cattails (*Typha* sp.) for example send out rhizomes underground to foster new growth and bring the population to full bloom.



Areas of Concern

The round farm pond south of the road – It probably would not be practical to try to recreate the entire wetland landscape that existed in 1934. The small pond pictured here for instance is impounded by an earthen berm. There is a control structure in the pond that passes water under the berm and into a small wet area. Flow must be fairly constant as that outlet area was home to a large snapping turtle (*Chelydra* sp.) observed during the field review. At the time of the review

both the bermed-in pond and the outfall wetland were thickly covered with bright green duckweed (*Lemna* sp.).



This view is from the earthen berm looking northeast across the duckweed-covered pond.



The duckweed covered water in the bermed pond can be seen (above) outletting into a corrugated metal pipe which passes under the berm into a small outfall pond before continuing downstream.

The rectangular pond in southwest corner of the northern property – is an addition in the last several decades.



The 1934 photograph on the left shows the darker soil and serpentine nature of the wetland path north of Boulder Road and below the orchard trees. In the 2004 photo on the right the rectangular pond, the grassy field, and the channelized stream are readily apparent.

At three tenths of an acre in size, this pond sits on a 3.6 acre portion of the landscape that is mapped as wetland. And it is quite different from the roundish pond described above for two reasons. First, whereas the previous pond and its outfall are surrounded by a natural diversity of vegetation, this pond has “lawn” right up to the edge. Secondly, this pond is largely impacted by algae mats versus the duck weed of the previous pond. Algae is simply a plant and when it successfully dominates its host water body the question is – how does this plant become so well fertilized to grow so richly? Is the lawn-to-the-edge-of-the-water fertilized and the fertilizer runoff feeds the pond’s algae? Must the grass be cut so closely to the water’s edge - a practice which encourages Canada Geese (*Branta canadensis*) to take up seasonal or permanent residence? Is it understood that the geese have ~one pound of output per bird per day. Every day. So ten or fifteen or twenty pounds of manure-based runoff every single day would contribute to the nutrient enrichment and a super-fertilized water body where algae will successfully prosper.



This mosaic is of the rectangular pond looking north. The bridge over outlet stream is visible in the top left. Clumps and mats of algae are easily visible across the water surface.

Suggestions

There is no question that the value of agriculture in a rapidly developing suburban area is high. And at this juncture Cheshire has the opportunity few towns do to make the most of this large parcel.

Included in any plan should be the successful reestablishment of wetlands in all of those areas that are underlain with, and mapped as, wetland soils. The successional growth will provide an excellent educational opportunity for area schools of many levels.

- Because of the many invasion opportunistic plants that exist on the landscape today a natural succession may have to be monitored during the first few years and the invasives removed to allow natural wetland species to repopulate.
- It should be noted that the NRCS mapping has three acres as its smallest mapping unit. Thus, on the web-based wetland maps available for this area many small wetlands of one-half to two + acres could easily be overlooked. The only way to include all wetland areas in future planning would be to have additional soil mapping done in areas not included in the NRCS mapping.
- The historic alteration of wetlands south of Boulder Road and west of the pond needs to be investigated to understand how it was done. As the Friends of Boulder Knoll has listed many items on their 'to-do' list, so should be added: the investigation and removal or dismantling of all drainage tiles. For, in large measure the wetlands are all about hydrology and any historic measures used to alter that natural hydrologic regime should be rendered useless and ineffective as the wetlands begin to attain more of a semblance of their natural state.
- The proposal submitted by the Friends of Boulder Knoll dated September 29, 2006 describes and depicts in Appendix A (document page 36), four numbered and prioritized potentially valuable locations for agricultural use. Site number four, while listed forth of four might very well conflict with wetland soils and thus any plan for successional regrowth of the wetland vegetation. Further soils mapping should be done here and incorporated into any action plan. Potential verbal conflict may occur in the document as on the top of page six the Friends state: "Friends of Boulder Knoll recommend that all land south of Boulder Road, except the areas surrounding the barns and the field east of the barns, be permanently dedicated to wildlife conservation and public walking trails." It could appear to some readers that those two statements are in conflict with each other.

Aquatic Resources

Site Description

There are three ponds and several intermittent drainages on the 150.53-acre Boulder Knoll open space parcel. The ponds range in size from approximately 0.16 to 0.75 acre in surface area. The ponds are all artificial in nature likely being constructed to provide a water supply source associated with dairy operations that previously occurred on the Blauvelt property, Jackman Farm, and Lassen Farm; these properties have been combined to create the Boulder Knoll open space parcel. The ponds appear to be relatively shallow given their support of moderate growths of emergent and submergent aquatic vegetation.



Small pond on the Boulder Knoll open space parcel south of Boulder Road.

Although the site has been subject to agricultural development, buffers of wetlands and/or second growth field occur adjacent to the Boulder Knoll's ponds and intermittent drainages. This has provided an effective means of protecting surface water quality. The Department of Environmental Protection classifies the surface waters on the parcel north of Boulder Road (*DEP Drainage Basin #: 5204, Broad Brook*) and south of Boulder Road (*DEP Drainage Basin #: 5302, Mill River*) as *Class AA* surface waters. Designated uses for *Class AA* surface water are existing or potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply, and other uses. Recreational uses may be restricted.



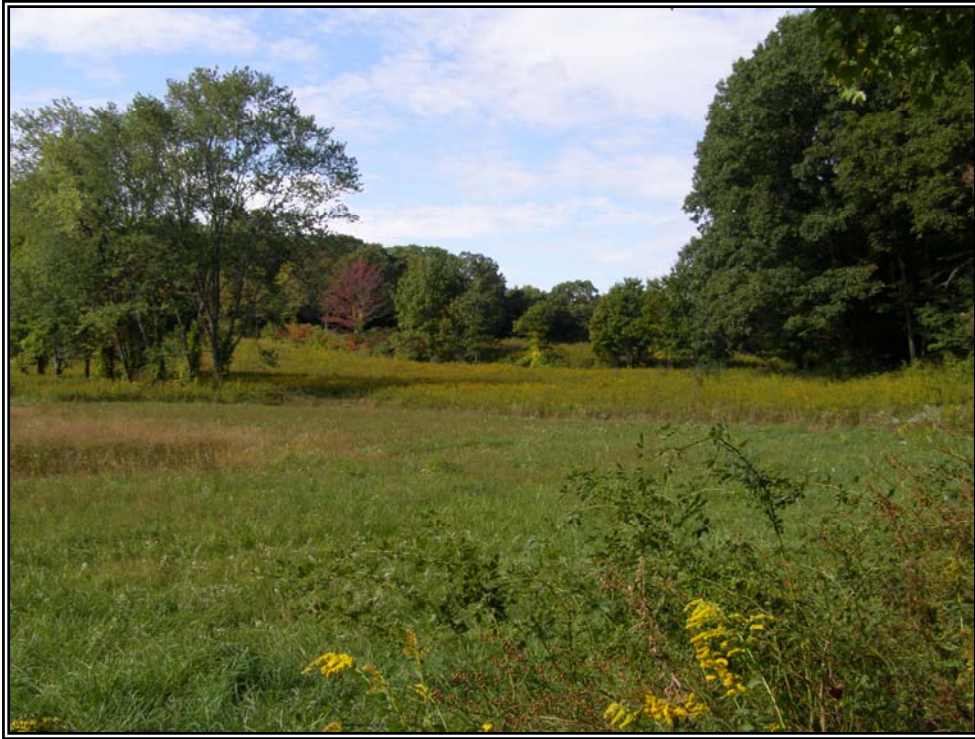
Intermittent drainage on the Boulder Knoll open space parcel north of Boulder Road.

Aquatic Resources

With a shallow water depths and moderate aquatic plant growth, the ponds on the Boulder Knoll open space parcel can be classified as warm-water resources. The fish species commonly associated with warm-water lakes and ponds in Connecticut include largemouth bass, bluegill, golden shiner, and brown bullhead. Formal surveys have never been conducted to evaluate the resident fish population of the ponds and fish were not observed during the field review.

Resource Impacts

As previously mentioned, the Boulder Knoll open space parcel has been subject to agricultural development conducted in a manner maintaining buffers of wetlands and/or second growth field adjacent to the site's surface waters which has subsequently provided an effective means of protecting aquatic habitats and surface water quality. Taken as a whole, maintaining the site as open space is not anticipated to produce a land use change that would adversely impact the aquatic resources found on-site or in off-site locations elsewhere in the drainage basins.



Second growth field adjacent to a pond on the Boulder Knoll open space parcel north of Boulder Road.

Property Management Recommendations

1. Should there be future land use change on the Boulder Knoll open space parcel, it is imperative that vegetated buffers be maintained around the ponds and intermittent drainages. The buffer should have a minimum width of 100 feet around the pond perimeters and 50 feet along each bank of the intermittent drainages. Research has indicated that buffer zones of these widths prevents damage to aquatic ecosystems. Buffers absorb surface runoff, and the pollutants they may carry, before they enter wetlands or surface waters.
2. None of the three ponds offer an opportunity to support recreational angling. Research has shown that ponds less than one acre in size are difficult to manage for angling as they either may not contain sufficient fish populations or have fish populations which may be drastically altered with even the slightest fishing pressure. However, the ponds would likely be valuable educational resources.

Wildlife Resources

A site inspection was conducted to evaluate existing wildlife habitat on the property. The site is the largest open space property on the eastern border of Cheshire and Wallingford. The area is approximately 150 acres, made up of three separate parcels, mostly former dairy farm. The town has adopted a management plan describing general use of specific areas of the property and has requested a review of the plan as well as a site investigation to supplement information about the site that is not provided in the plan (habitat analysis, suitable land uses, etc.). The site is comprised of a myriad of habitat types including active agricultural land, old fields, shrublands, and forested rocky ledges. Wetlands include ponds and intermittent streams.

Existing Wildlife Habitats

The areas south of Boulder Road include old pastures and old fields, open grasses, shrubby areas, and a forested rise containing numerous cedar trees. Wetlands south of Boulder Road include an old farm pond and small streams. Areas east and southeast of the barns are moderately thick with non-native invasive species including Asiatic bittersweet, multiflora rose and autumn olive, while the south and western portions include open fields. Old field and open field habitats are valuable to a large number of species, including birds such as field sparrow, indigo bunting and American goldfinch, herbivores such as meadow jumping mouse, cottontail rabbit, woodchuck, and reptiles such as garter snake and black racer. Open fields are heavily utilized by many invertebrates, which, in turn, are preyed upon by insect-eating birds and small mammals, which are then preyed upon by raptors and larger mammals such as red fox and coyote. Areas of more stunted, scrubby growth provide both food and cover for species that utilize shrubland habitat, such as cottontails, hognose snake, and eastern towhee.

The areas north of Boulder Road contain active agricultural fields, wet meadows, and wooded ledges. The active agricultural fields on the eastern side of the property are planted alternately with hay and corn, with 3 acres planted in sunflowers. While agriculture is an important land use to keep land open and cool season grasses (agricultural grasses) can provide valuable bird habitat, the intensive farming practices utilized today can also contribute to the decline of some wildlife species. Multiple hay cuttings conducted from May to August prevent grassland-nesting birds from completing their nesting cycle.

Wet meadow, a relatively uncommon habitat type in Connecticut, is found in the central portion of the property. Wet meadow habitat is created in grass-dominated areas where water seasonally pools or floods, or where the water table is close to the surface. This habitat type is often maintained by periodic mowing or haying. Many of these areas have limited agricultural value, but provide excellent wildlife habitat. Vegetation typically includes a

variety of herbaceous growth, including forbs, grasses, flowers, sedges, and rushes (i.e. reed canarygrass, common reed, big bluestem, bluebell bellflower, bluejoint, tussock sedge). Examples of species that may make use of wet meadow habitat include spotted turtle and green snake. As agricultural pressure has increased, many sites containing wet meadows have been altered through channelization of water, ditching, or creation of berms.

There is a wooded ledge/slope west of the wet meadow area and hayfields are found further west of this ledge. Forested areas are valuable to wildlife, providing cover, food, nesting and roosting places and denning sites. Mast or acorns produced by oaks provides excellent forage for a wide variety of mammals and birds including white-tailed deer, gray squirrel, southern flying squirrel, eastern chipmunk, white-footed mouse, eastern wild turkey and blue jay. Trees, both living and dead, also serve as a home for a variety of insects, which, in turn, are eaten by many species of birds, including woodpeckers, warblers and nuthatches.

The area also contains several ponds and intermittent streams. Wildlife likely utilizing wetland habitat for food and cover are raccoons, star-nosed moles, pickerel frogs, spring peepers and eastern garter snakes.

Habitat Management Recommendations

Early successional habitats (fields, shrublands, grasslands, meadows) such as those found on the Boulder Knoll property are rapidly declining in Connecticut. This decline is due to development and natural succession, where farmland abandoned years ago has grown up into forestland. Interruptions of natural processes that create early successional habitats across the landscape (fire, flooding, etc.) have also contributed to this decline. All of these factors have combined to result in species declines for most grassland specialists. Many of Connecticut's grassland specialist birds, including bobolink, savannah sparrow and grasshopper sparrow, are included on the state list of endangered, threatened and special concern species. Other species that make use of these habitat types include eastern box turtle, ribbon snake, and bronze copper (butterfly).

The current management plan for the property allows for continued agricultural use of existing field areas and calls for woodlands, wetlands and watercourses to be maintained in a natural state. Passive recreation, as defined in the Town of Cheshire Code of Ordinances, is allowed for the field area in the northeastern portion of the property.

One of the most important recommendations for managing this area is to limit its use to the types of recreation compatible with wildlife. Highly disturbing, intense-use activities such as ball fields, model airplane fields, etc. would significantly diminish the value to wildlife. In general, low-disturbance recreational activities (walking, biking, etc.) should be limited to use of the established trails. If new trails are to be established, guidelines for protecting wildlife resources should be followed (see Attachment A). Dogs should be leashed at all times and should not be allowed to run through any fields, particularly during the bird nesting season (April – August), in order to minimize nest disturbance and general harassment of wildlife.

Another important management recommendation is to conduct any mowing late in the season. Habitat management should include mowing and/or brush hogging every few years the open fields, shrublands and wet meadows that are not actively farmed (in order to keep the area from succeeding into forest/woody vegetation). If feasible given the competing demands on the property, agricultural fields should be mowed outside of the active bird nesting season (April through August) and foraging season for reptiles such as box turtles (generally April through October).

Ideally, habitat management should also include non-native invasive species control. Invasive species such as autumn olive and Asiatic bittersweet can become the dominant vegetation, significantly reducing plant diversity. They displace native vegetation that provides high-quality forage, thereby diminishing the value of an area to wildlife. Invasive species control can be accomplished through manual pulling (although very labor intensive) or through the use of herbicides such as Roundup®. Agricultural fields (particularly those that are 5 acres or larger) that are no longer planted to a crop species could be converted to native warm-season grasses or meadows to benefit species such as bobolink and eastern meadowlark.

If cutting in the forested areas, standing dead trees (snags) as well as any trees with unusual structure should be left standing. Snags provide both nesting sites and foraging opportunities for cavity-nesting species and insect-eating birds. Additionally, cedar trees should also be left standing, due to their value for wildlife in providing food, cover and shelter.

Summary

The Boulder Knoll property provides high-value habitat for wildlife due to both its large size and the variety of habitats of which it is comprised. Large parcels of early successional farmland containing multiple habitat types are increasingly rare in Connecticut, as development creates small, isolated patches of habitat in the landscape. For wildlife, large blocks of habitat are always better, as they can provide a greater variety of food (different types of acorns, catkins, a variety of fruits, etc.), more nesting and roosting sites, and areas for cover. To gain the most benefit for wildlife, fields over 5 acres should be managed for grassland birds when possible. Five acres is the minimum useful to bobolinks, the species with the least minimum breeding acreage requirement. In order to provide sufficient time for grassland birds to complete their nesting cycle, all fields (including those actively farmed) should be mowed no earlier than August 1. Continued stewardship of this area will conserve the inherent wildlife values and maintaining the early successional habitat will provide for many species with declining populations.

Attachment A

General Guidelines For Protecting Wildlife Resources When Developing Trails

Some properties may lend themselves to providing a variety of recreational opportunities (e.g., hiking, hunting, fishing, nature study and photography, horseback riding, mountain biking.) Properly designed trails can provide excellent opportunities to increase public appreciation for wildlife and the ecological values of various habitats. Trails should be designed to enhance the learning and aesthetic aspects of outdoor recreation while minimizing damage to the landscape. They should be laid out to pass by or through the various cover types and other special features represented on the property while avoiding those areas prone to erosion or that contain plants or animals that may be impacted by human disturbance. Uses that are generally considered “compatible” could impact sensitive resources depending on the location, timing and frequency of their occurrence. For example, while regulated fishing is considered an accepted form of outdoor recreation, there could be impacts associated with it, such as streambank erosion at heavily used sites. The overall level of disturbance to vegetation/habitat and wildlife can be significantly reduced by establishing one or two (will depend on property size and degree of importance to natural resources) multiple-use trails rather than several single/exclusive-use trails.

Some guidelines to follow when developing a trail system include:

- Narrow, passive-use recreation trails with natural substrate that would require minimal vegetation removal, maintain forest canopy closure, prohibit the use of motorized vehicles, and require dog owners to keep their dogs under control, are preferred to reduce environmental impacts and disturbance to wildlife. Abandoned roadways (e.g., farm/logging roads) should be incorporated into the trail system whenever possible and appropriate to minimize cutting activity/vegetation removal;
- If a paved, multi-purpose trail is established, avoid the use of curbing. If it is necessary, Cape Cod style curbing (curbing at 45 degree angle) is recommended;
- Know the characteristics of the property and plan the layout so that the trail passes by or through a variety of habitat types;
- Make the trail as exciting and safe as possible and follow a closed loop design. Avoid long straight stretches of >100'; trails with curves and bends add an element of surprise and anticipation and appear more “natural”;
- Traversing wetlands and steep slopes should be avoided whenever possible to minimize erosion and sedimentation problems; where wetlands must be crossed, a boardwalk system should be used;
- The property boundaries and trail should be well marked. It is best to provide a map/informational leaflet describing the wildlife values associated with the property (e.g., value of wetlands, various habitat types/stages of succession, habitat management practices) and guidelines for responsible trail use;
- Potential impacts of trails on private property owners should be identified. Where trails bisect private property, the access should be of adequate width and the trail well-marked to help avoid potential conflicts (e.g., trespass by trail users);

- For more specific guidance on trail design and construction contact the Connecticut Forest & Park Association (860-346-2372 or www.ctwoodlands.org) or Appalachian Mountain Club (www.outdoors.org);
- For an extensive literature review about the effects of different types of recreation activities on wildlife, visit web site www.Montanatws.org – 307 page document published in 1999 entitled, “Effects of recreation on Rocky Mountain wildlife: A review for Montana.”

Prepared by the CT DEP Wildlife Division for the Partners In Stewardship Program (June 2002)

Questions? Contact CT DEP Wildlife Division at 860-295-9523 (Eastern CT) or 860-675-8130 (Western CT)

Vegetation Resources

Overview

The Boulder Knoll Open Space Property totals approximately 150.5 acres and is made up of three contiguous farm parcels that were acquired by the town beginning in 1994. These parcels are an important link in the town's long-range goal to create a "greenbelt" along the Cheshire-Wallingford border. In addition, the Management Plan for these parcels that was adopted by the Town Council in June of 2005, states that they will be managed for a combination of public access and passive recreation, wetland and upland habitat conservation, and active agricultural purposes.

Vegetation

The Boulder Knoll Open Space Property may be divided into several broad vegetation categories. These include open fields, open field/wet meadows, mixed hardwoods, open shrub swamps, hardwood swamps, plantations and old fields. Below are brief descriptions of each of the vegetation categories found on this property. They are depicted on the Vegetation Type Map. The location and acreage of these areas are approximate and were obtained from 1990, 1995 and 2004 aerial photographs and 2004 orthophotographs. The field inventory of vegetation types was conducted in October of 2007. A more comprehensive inventory of the herbaceous vegetation that is present in each of these categories should be made at different times throughout the year by a qualified botanist.

The vegetation that has developed on this tract is diverse and strongly reflects the soils that are present and the past agricultural use of the land. In some areas a clear succession from once open pastureland to a dense mixed hardwood forest is apparent. Old stone and barbed wire fences delineate some of these areas. As a result of this succession, the trees are older and generally larger in the areas that were abandoned earlier. Younger trees, including pioneer species such as gray birch and eastern red cedar, are present in the areas that were abandoned more recently. Goldenrod and hardwood shrubs (both native and non-native) have become established in areas where mowing has not occurred in the past several years.

Several non-native invasive plant species have become established throughout this property. These include multiflora rose, autumn olive, several species of bush honeysuckle, tree-of-heaven, winged euonymus, Japanese barberry, Asiatic bittersweet, Japanese honeysuckle, Canada thistle, wineberry and common reed (*Phragmites*). In this report, non-native invasive plant species will be marked with an "*" for easier identification in the vegetation type descriptions.

These species are of special concern because they are non-native and have the potential to become major components of the ecosystem by out competing native species. Although some of these species provide wildlife with food and cover, they are aggressive competitors, disrupt natural ecosystem balance and degrade biodiversity.

At the present time, mechanical removal (pulling) of some of these plants should be effective especially where limited numbers of individuals are present. This type of removal usually works best with shrub species when the soil is moist. Plants that are removed in this way should not be placed back on the ground because many of these species will re-root and become reestablished.

The often-practiced technique of repeated cutting, when practiced alone, may encourage vigorous resprouting by the more aggressive non-native species and therefore should be avoided or used in combination with other practices.

In areas where non-native invasive species are well established, an Integrated Vegetation Management (IVM) approach may be the most practical solution and should be considered. The IVM approach utilizes a combination of control methods to best manage targeted populations of non-native invasive species. These options may include mechanical, chemical, cultural and biological methods. The goal of this approach is to discourage (manage) the non-native invasive species and encourage the natural re-establishment of native plant communities.

An example of an IVM approach to controlling autumn olive that has become established in an open field would be:

1. Mechanically cut autumn olive (target species) at ground level.
2. To control future sprouting, treat the freshly cut stump by spraying or painting an approved herbicide within ½ hour on only the stump.
3. Follow up in several months or the next growing season by treating any stumps that have re-sprouted with a targeted foliar application of herbicide or spot treat with a backpack torch. (see below)
4. Monitor annually and spot treat new invasions with herbicides or spot treat with a backpack torch.

While the use of large scale prescribed fire may not be an option for this tract, the use of backpack torches may be an acceptable alternative to herbicide use where spot treatments of individual plants are desired. The Connecticut Agricultural Experiment Station, in collaboration with several partners, is conducting research to determine the effectiveness and practicality of utilizing backpack torches as an alternative to herbicide use on several target non-native invasive shrub species. The preliminary results should be available shortly. Backpack torches should only be used when conditions are such that there is no chance of starting a wildfire.

If no effort is made at this time to control the non-native invasive species that are present on this property, they will become more widespread and their control will become much more difficult. The most up-to-date control and management information on non-native invasive species may be found at the following web site: <http://tncweeds.ucdavis.edu/esadocs.html>

Specific forest management recommendations aimed at improving the overall health, stability and diversity of the forested portions of this property are suggested for areas where implementation is not restricted by access, site limitations or deed. Management practices include crop tree selection and release (focused on removing the unhealthy and poor quality

trees that are interfering with the growth of healthy trees) and invasive species control and management. Specific recommendations may be found in the individual vegetation type descriptions.

It is important to note that the property boundaries should be located and clearly marked before any management activities are implemented.

Vegetation Type Descriptions

A. Open Field: The Open Field vegetation type makes up approximately 65.5 acres of this tract. Due to past grazing practices and the suspension of mowing, the majority of this vegetation type has become dominated by several species of goldenrod. In addition, localized patches of woody vegetation including both native and non-native invasive species are encroaching upon many portions of this area. The woody vegetation that is becoming established in some areas includes hardwood tree seedlings (red maple, apple, white ash, gray birch, black willow and tree-of-heaven*), eastern red cedar, multiflora rose*, autumn olive*, speckled alder, steplebush, smooth sumac, staghorn sumac, gray dogwood, bush honeysuckle*, Japanese honeysuckle*, Asiatic bittersweet*, grape, and poison ivy. Many of these species provide very important early successional habitat for many species of wildlife. However, the non-native species are aggressive competitors with native plants and should be eradicated.

The herbaceous vegetation that is present includes many species of goldenrod, assorted grasses, ragweed, common milkweed, poke milkweed, spreading dogbane, intermediate dogbane, Queen Anne's lace, lamb's quarters, evening primrose, common mullein, raspberry, wineberry*, blackberry, pokeweed, hemlock parsley, cow parsnip, wild parsnip, white snakeroot, common burdock, dodder, black-eyed Susan, ox-eyed daisy, daisy fleabane, white clover, bedstraw, cleavers, beggar-ticks, Canada thistle*, horseweed, chicory, field pussytoes, cinquefoil and many species of aster.

Occasional small patches of common reed* (Phragmites), common cattail, sedges, fringed gentian and sensitive fern have become established on the poorly drained areas and drainage ditches that were previously mowed.

Of concern are several specimens of tree-of-heaven* which are non-native invasive species that are extremely prolific sprouters. These trees were recently cut and it is not clear if the freshly cut stumps were treated with herbicides to control sprouting. They are located south of Boulder road just east of the power line. This area should be inspected in spring of 2008 to determine if new sprouting has occurred. If so, any new sprouts should be eradicated.

The intended use of this area will dictate appropriate management activities. If no management is implemented, the non-native invasive species that are present will become more and abundant reducing the extent of native vegetation and making access into this area even more difficult. In addition, unless some schedule of mowing is resumed, the build up of thatch from the goldenrod and other vegetation may become a wildfire hazard.

B. Open Field/Wet Meadow: This vegetation type totals approximately 18 acres and is dominated by several species of grasses and sedges. Some of these areas are being periodically mowed for the production of hay. This activity is discouraging the establishment of other species of vegetation including woody vegetation.

C. Mixed Hardwoods: This Mixed Hardwoods type corresponds to the basalt ridge that runs north and south through the property. It totals approximately 13 acres and is made up of reasonably healthy pole to sawtimber size sugar maple, red oak, black birch, shagbark hickory, mockernut hickory, American beech, white ash and American elm with occasional black cherry and black oak intermixed. Understory vegetation includes seedling and sapling size sugar maple, American hornbeam, hophornbeam, American beech, and black birch. Witchhazel, maple leaved viburnum, wineberry*, Japanese barberry*, grape and poison ivy are also present. Ground cover consists of evergreen woodfern, bloodroot, early meadow-rue, wood anemone, aster spp., grasses and sedges.

Several dead trees are located near the trail that runs through this vegetation type. Removal of these trees would reduce the potential risk to trail users. A farm implement dumpsite is located at the base of the ridge on the northwestern portion of this vegetation type. Removal of this debris would improve the aesthetics of the area and eliminate a potentially hazardous condition. At this time the number of individual non-native plants is relatively low. Chances are good that unless these individuals are eradicated they will multiply and disrupt the natural balance of native vegetation in this area.

D. Open Shrub Swamp: Approximately 10 acres of Open Shrub Swamp are present within this property. The tree species that are present include seedling to sapling size red maple, American elm, white ash and eastern red cedar. Shrub species include speckled alder, highbush blueberry, swamp azalea, arrowwood viburnum, elderberry, multiflora rose*, winterberry, maleberry and alternate leaved dogwood. Skunk cabbage, tussock sedge, club moss, sphagnum moss, poison ivy, greenbrier, goldenrod, steeplebush, meadowsweet, raspberry, sensitive fern and sedges are present as ground cover. A few very small patches of common reed* have recently become established under the power lines. This is the time to eradicate these patches before they spread any further.

E. Hardwood Swamp: There are several Hardwood Swamp areas that total approximately 8 acres located within this tract. The vegetation that is present in all of these wetlands is somewhat variable but generally dominated by sapling to small sawtimber size red maple in clumps. Other tree species that are present include American elm, black birch, tuliptree, yellow birch, sugar maple, white ash, red oak, American beech, mockernut hickory, black cherry and black oak depending on which wetland is being considered. All size classes are represented in these wetlands. Shrub species that are present include spicebush, multiflora rose*, winged euonymus*, highbush blueberry, swamp azalea, winterberry, nannyberry, arrowwood viburnum, hophornbeam, American hornbeam and witch-hazel. Skunk cabbage, tussock sedge, club moss, sphagnum moss, poison ivy, Asiatic bittersweet*, cinnamon fern, sensitive fern and Christmas fern are also present. Several of the large 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 called snags that are being utilized by a variety of birds. Management of these areas for wood products is severely limited by the saturated soils that are present.

F. Plantation: This vegetation type totals approximately 5 acres and is made up of an overgrown Christmas Tree Plantation and individual Christmas tree species that were planted near dwellings. Included are all size classes of white spruce, Colorado blue spruce, Norway spruce, Douglas fir and Scotch pine. Grasses and goldenrod dominate the open spaces that are present between the neglected Christmas trees. Unfortunately, in some areas bush honeysuckle*, multiflora rose* and autumn olive* have become established. Many of the trees are healthy and could still be utilized as Christmas trees or left to grow larger providing cover for wildlife, vegetative diversity and aesthetic beauty.

G. Mixed Hardwoods: Several miscellaneous Mixed Hardwood areas have been included in this vegetation type, which totals approximately 3 acres. Included but not necessarily found together are all size classes of red maple, sugar maple, Chinese chestnut, hickory, red oak, black cherry and black birch. These hardwood patches are located in areas adjacent to Boulder Road, the power lines and in the areas that separate open fields and plantations. Several of these areas have an understory of hardwood tree seedlings and may also include Japanese barberry*, winged euonymus* and Asiatic Bittersweet*.

H. Wetland/Phragmites: A 2.5+- acre band of common reed* (Phragmites) has become established in the wetland associated with one of the tributaries to Broad Brook. This non-native invasive species has the potential to spread rapidly throughout open wetland areas that have imbalances in nutrient or salinity levels. Its rapid growth rate allows it to displace more diverse native marsh vegetation. Effective control is difficult and includes at least two herbicide treatments. Removal of the thatch, once the area has been treated with herbicides, is essential to allow native species to re-vegetate the area. More in-depth control strategies may be found at: <http://tncweeds.ucdavis.edu/esadocs.html>

I. Mixed Hardwoods: This 2+- acre Mixed Hardwood stand is located on a rocky knoll south of Boulder Road. All size classes are represented in this vegetation type, however larger trees are dominant. Included are red oak, red maple, black oak, sugar maple, black birch, shagbark hickory, pignut hickory, mockernut hickory, eastern red cedar and sycamore. Hardwood tree seedlings (dominated by sugar maple), hop hornbeam, American hornbeam, winged euonymus*, multiflora rose*, Japanese barberry*, autumn olive* and Asiatic bittersweet* are present in the understory along with scattered eastern red cedar seedlings. Ground cover vegetation includes goldenrod, grasses, sedges, poison ivy, wineberry*, evergreen woodfern and Christmas fern. Management of the non-native invasive species that are present will be difficult due to the rocky nature of this site. However, if nothing is done to control these species conditions will only get worse. Once the non-native invasive species are under control, this area would make an excellent picnic site.

J. Old Field: Several small Old field areas that total approximately 2 acres are present on this property. These areas are dominated by scattered eastern red cedar, gray birch and occasional large red oak, scarlet oak and black oak with large spreading crowns that were present when these areas were being pastured. Also present are a few eastern white pine. Autumn olive*, multiflora rose* and Asiatic bittersweet* are the shrub and vine species that are dominant. Grasses and goldenrod form a dense ground cover in these areas.

K. Mixed Hardwoods: This Mixed Hardwood vegetation type totals approximately 1.5 acres. Large healthy red oak, white ash, shagbark hickory, mockernut hickory, sugar maple, red maple, American elm, black birch and black cherry dominate the overstory. The understory vegetation includes hardwood tree seedlings, maple leaved viburnum, hophornbeam, American hornbeam, witch-hazel, highbush blueberry, spice bush, red osier dogwood, multiflora rose*, Japanese barberry* and winged euonymus*. Ground cover vegetation includes poison ivy, Virginia creeper, grape vines, rattlesnake plantain, Canada mayflower, wood aster, club moss, bracken fern, Christmas fern, evergreen wood fern, hayscented fern, royal fern and many other species of grasses, sedges and wild flowers.

Although many of the larger trees are healthy, the trees in this stand are becoming crowded. A small scale fuelwood thinning following the Crop Tree Selection method of thinning would help to reduce the crowded condition and allow potential crop trees to improve in health and vigor over time. Trees that are removed to release crop trees, may be harvested and utilized as fuelwood, felled or deadened in place and left standing for wildlife. Up to 40 trees per acre in this area could be chosen as crop trees. These trees should be released to full sunlight by removing the competing trees from three out of four sides of their crowns. Poor quality defective trees that are not providing specific benefits to wildlife such as the production of desirable mast or suitable cavities may also be harvested or deadened in place at this time. It is imperative that the non-native invasive species that are present be controlled before any thinning is implemented.

L. Old Field: This Old Field area totals approximately 1 acre and is dominated by crowded seedling to sapling size eastern red cedar with red maple, gray birch, white ash and black cherry intermixed. Understory and ground cover vegetation includes hardwood tree seedlings, choke cherry, highbush blueberry, maleberry, autumn olive*, multiflora rose*, gray-stemmed dogwood, steeplebush, arrowwood viburnum, Asiatic bittersweet*, Japanese honeysuckle*, poison ivy, goldenrod, grasses, black-eyed Susan, milkweed, common dewberry and blackberry. This area provides wildlife with excellent early succession habitat. In order to maintain and enhance the native shrub component of this area, the non-native invasive species should be eradicated.

M. Mixed Hardwoods: Pole size bigtooth aspen are the dominant tree species found in this Mixed Hardwood stand which totals approximately 1 acre. Also present are red maple, black oak, red oak, white oak, black birch and American beech. Hardwood tree seedlings, arrowwood viburnum, maple leaved viburnum and multiflora rose* form the understory vegetation.

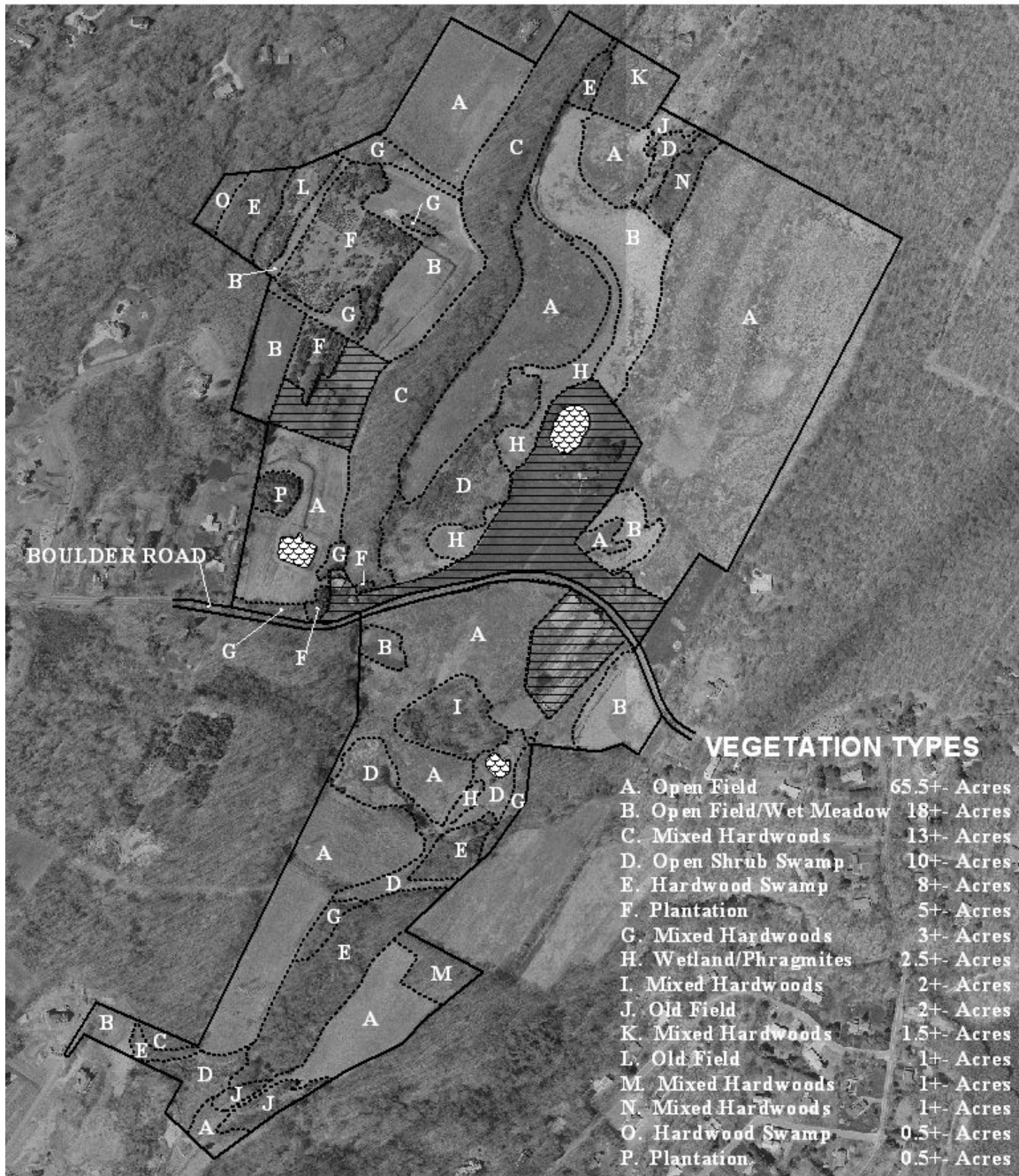
The trees in this stand are becoming crowded. A small scale fuelwood thinning following the Crop Tree Selection method of thinning would help to reduce the crowded condition and allow potential crop trees to improve in health and vigor over time. Trees that are removed to release crop trees, may be harvested and utilized as fuelwood, felled or deadened in place and left standing for wildlife. Up to 40 trees in this area could be chosen as crop trees. These trees should be released to full sunlight by removing the competing trees from three out of four sides of their crowns. Poor quality defective trees that are not providing specific benefits to wildlife such as the production of desirable mast or suitable cavities may also be harvested or deadened in place at this time. The multiflora rose* that are present should be removed before any thinning is implemented.

N. Mixed Hardwoods: This 1+- acre Mixed Hardwood stand is made up of predominantly pole size red maple, black birch, red oak, white ash, American elm, black cherry, mockernut hickory, shagbark hickory, sassafras and eastern red cedar. Understory vegetation includes spicebush, deciduous holly, grape, poison ivy, multiflora rose*, Japanese barberry*, Asiatic bittersweet* and wineberry*. The majority of trees that are present in this stand are of poor quality and are declining in health. However, several of the larger white ash and red oak appear to be healthy and vigorous. Some of the trees that are directly competing with the healthy trees could be removed or deadened in place to assure their continued health.

O. Hardwood Swamp: Unlike the other Hardwood Swamps that are present on this tract, this 0.5 +- acre young stand is dominated by seedling size clumps of red maple along with occasional seedling size white ash and American elm. Tussock sedge, skunk cabbage and sphagnum moss are also present along with highbush blueberry and arrowwood viburnum.

P.Plantation: This plantation, which totals approximately 0.5 acres, is made up of eastern white pines that are declining in health due to their crowded condition. They are predominantly pole size with a few larger individuals. A thinning following the Crop Tree Selection method of thinning would help to reduce the crowded condition and allow potential crop trees to improve in health and vigor over time. The crop trees that are chosen should be the healthiest and largest crowned trees that are present. Trees that are removed to release the crop trees may be felled or deadened in place and left standing for wildlife. Crop trees should be released to full sunlight by removing the competing trees from three out of four sides of their crowns. Poor quality defective trees may also be harvested or deadened in place at this time. If managed properly this plantation could be developed into beautiful picnic site.

**BOULDER KNOLL OPEN SPACE
CHESHIRE, CT
VEGETATION TYPE MAP**

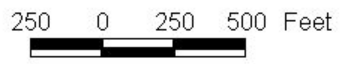


VEGETATION TYPES

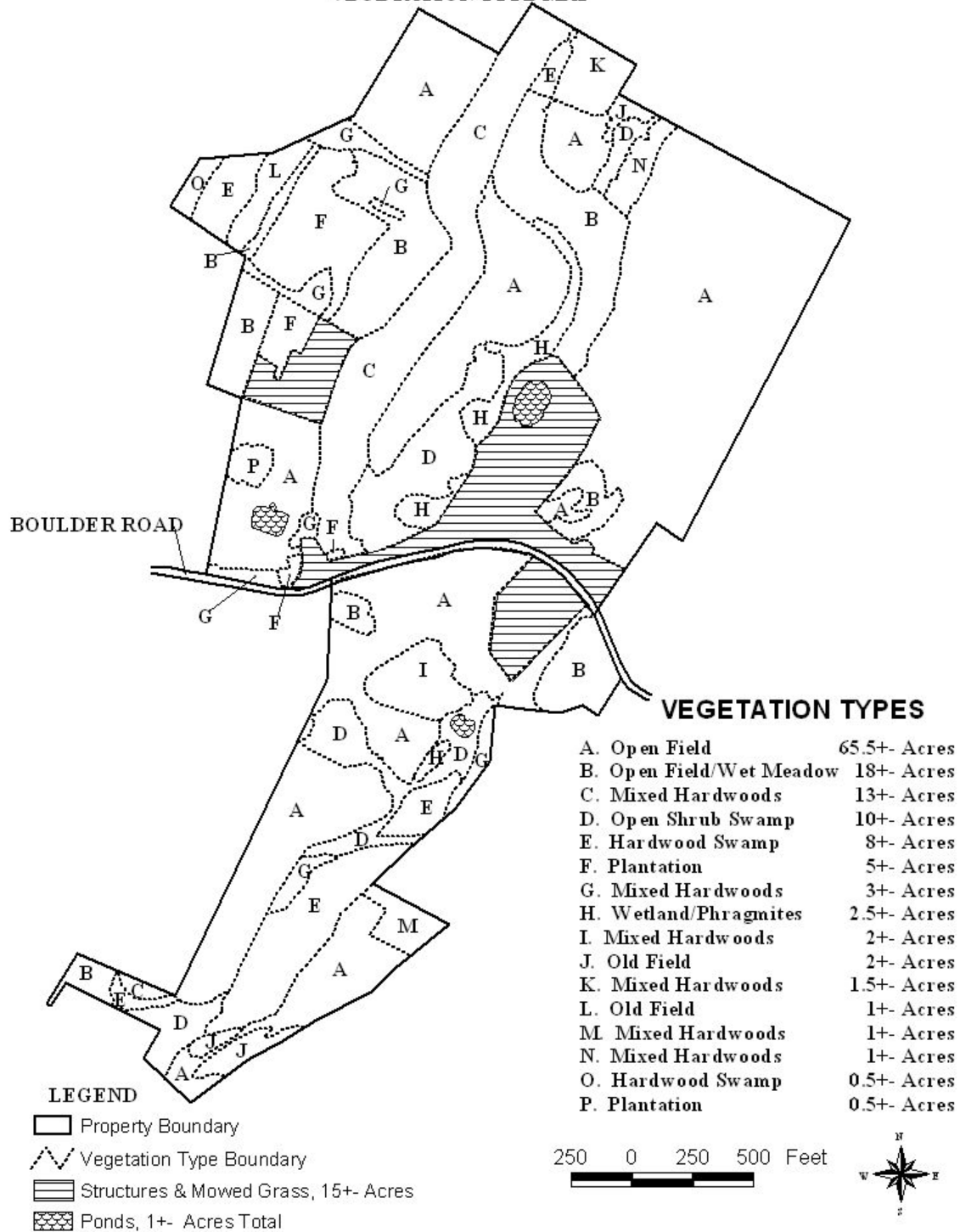
| | |
|--------------------------|--------------|
| A. Open Field | 65.5+- Acres |
| B. Open Field/Wet Meadow | 18+- Acres |
| C. Mixed Hardwoods | 13+- Acres |
| D. Open Shrub Swamp | 10+- Acres |
| E. Hardwood Swamp | 8+- Acres |
| F. Plantation | 5+- Acres |
| G. Mixed Hardwoods | 3+- Acres |
| H. Wetland/Phragmites | 2.5+- Acres |
| I. Mixed Hardwoods | 2+- Acres |
| J. Old Field | 2+- Acres |
| K. Mixed Hardwoods | 1.5+- Acres |
| L. Old Field | 1+- Acres |
| M. Mixed Hardwoods | 1+- Acres |
| N. Mixed Hardwoods | 1+- Acres |
| O. Hardwood Swamp | 0.5+- Acres |
| P. Plantation | 0.5+- Acres |

LEGEND

- Property Boundary
- Vegetation Type Boundary
- Streets & Mowed Grass, 15+- Acres
- Ponds, 1+- Acres Total



**BOULDER KNOLL OPEN SPACE
CHESHIRE, CT
VEGETATION TYPE MAP**



The Natural Diversity Data Base

The Natural Diversity Data Base maps and files for the project site have been reviewed. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species 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 Environmental and Geographic Information 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 substituted 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 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.

Archaeological and Historical Review

The Office of State Archaeology (OSA) and the State Historic Preservation Office (SHPO) recommends that the Town of Cheshire should restrict any ground disturbance near the circa, 1711 copper prospecting pit. Any future planning should include professionally-conducted archival and archaeological studies of this potentially significant early mining venture, and, as appropriately signage on 18th century mining should be developed. These historic features can provide important educational opportunities for the town's citizens and students. Most importantly, the Town of Cheshire should supplement and complement its existing information on historic structures by applying for grant assistance from CCT (SHPO) to conduct a property-wide assessment of prehistoric, historic and industrial archaeological resources. (See Appendix for an article on the Cheshire Copper Mines.)

The Office of State Archaeology maintains an electronic version of archaeological sites in the Town of Cheshire including prehistoric, historic and industrial sites. They treat mapped versions of these sites similar to the Department of Environmental Protection's Natural Diversity Database. With guidelines provided due to threats of vandalism, OSA would be willing to work with the Town of Cheshire in providing data for site protection within their planning and zoning regulations.

The OSA and SHPO are available to provide technical assistance to the Town of Cheshire to accomplish the above recommendations. Should there be any questions regarding this review please contact them at the university.



Recreation Planner Review

The management plan for a property will be based upon the interplay between its physical character and the intent of the landowning entity. Thus the future of Boulder Knoll will be determined by its long history of agricultural use and the Town of Cheshire's intention to allow passive recreation, some continuation of agriculture, and wetland and habitat conservation.

In the opinion of this reviewer, this property's rolling farmland character limits its public recreational potential. The sole existing recreational facility is a short trail too limited to be of walking interest, with additional potential seemingly limited to a possible loop walkway roughly along the periphery of the property and perhaps including some adjoining presently private land. Thus general open space, agriculture, and/or habitat conservation seem more realistic management objectives. However, the relative emphasis given to these options should be determined by the fast-reverting nature of unused farmland and by the fate of the deteriorating barn complex, policy decisions facing the town of Cheshire.

Another management issue involves site security. Although structures within a property can pose an operating and maintenance (O&M) expense, the presence here of a home occupied by a Cheshire policeman does satisfactorily address the need for on-site patrol and security.

This reviewer sees three management options, based upon level of management: minimal, moderate and active as follows:

1) Minimal

Remove the barns and simply let the land revert. This option will involve low ongoing costs. However this option will in short order result in the loss of agricultural potential and limited open field habitat with its pastoral scenic vistas. No conflict with the area's availability for passive recreation should occur.

2) Moderate

Moderate management involves field mowing and casual public use. This option would maintain open field habitat with its scenic values. It could also involve some agricultural use, either under lease or as community gardens; low O&M costs are likely, unless the town must assume costs of mowing, either in terms of town staff and equipment or service contracts. A major question here concerns the barns and the possible need to use them for storage of town equipment maintaining the property.

3) Active

Active management with one or more agricultural operations (crop, hay) utilizing much of the property. A lease arrangement with services as reseeding, liming and some mowing in lieu of payments is suggested. This option would maintain the existing improved farmland and thereby its open field habitat and scenic values. However recreational, game habitat and agricultural interests would need to be reconciled seasonally and by site. In addition, the barns would need to be preserved and provide storage for equipment and supplies needed in the farm operation.

In conclusion, this reviewer personally prefers the *active option* as it would retain some of the local, fast-disappearing traditional agricultural land base and the aforesaid open field habitat, values which both outweigh the property's limited recreational potential. If this option does not prove feasible to implement, some variant of the *moderate option* may be the best approach to pursue.

Regional Planner Review

Land Use Plans

The preservation of the Boulder Knoll property on the east side of Cheshire is an important asset for Cheshire and the region, and an example of how effective open space strategies function within the framework of conservation and development plans. The initiative complements the Town's long-range plan to develop a "greenbelt" on the east side.

State Plan of Conservation and Development 2005-2010

The *Conservation and Development Policies and Plan for Connecticut 2005-2010* states that it is the intent of the General Assembly and state government to "preserve important historic, cultural, and natural aspects of our Connecticut heritage and maintain, where possible, an environment which supports diversity and variety of individual choice" (Goal #4). The Boulder Knoll property creates open space that can support an array of different purposes and activities. While part of the land has historically been used for agricultural purposes, the property also contains areas of interest that are significant to the preservation of wildlife habitats, woodlands, wetlands, and wet meadows. Boulder Knoll is also home to unique traprock formations that will be of particular interest to local geology students and research groups.

Regional Plan of Conservation and Development: 1998

The Regional Plan likewise supports the creation of open space in a manner that promotes diversity among the types of properties preserved. It is not enough to simply acquire a certain percentage of open space land for the region. Rather, the Plan suggests giving priority to:

- greenways (for wetland protection and wildlife habitat),
- open space connections (including trails),
- multi-purpose areas, and
- the preservation of visible parcels (ridgelines, scenic view areas, steep slopes, and historical or archeological sites).

Each of these characteristics is represented in the Boulder Knoll property, making it a valuable addition to the inventory of committed open space properties in the region.

The updated Regional Plan for 2008-2018 (currently in draft) will discuss the role of farm preservation in the context of general land use, but it will also make reference to a recent agricultural case study conducted in the Pomperaug River Watershed. The study evaluated the role of agriculture in the preservation of open space and found significant public support for farming both statewide and in its communities (Bethlehem, Woodbury, and Southbury). Some of the environmental benefits of preserving farmland were:

- maintaining and improving soil and water quality through preservation of prime agricultural soils with good water-holding capacity,
- protection of aquifer and ground-water re-charge capacity,
- filtering of pollutants before water enters water bodies,
- prevention of soil erosion,
- air quality: reduction of inputs through limits on residential growth,
- aquatic and terrestrial habitat protection and preservation of species diversity¹

The study also found that farmland preservation contributes certain quality of life and cultural benefits, particularly in towns that view maintaining “rural character” as an important part of their plan of conservation:

- preservation of community character, community cohesiveness, and continuity of way of life,
- preservation of historic features of towns, such as the rural working past and agricultural heritage,
- connection to local history, tradition, and historical dependence on the land,
- opportunities for recreation,
- scenic and aesthetic values,
- and relief from high-density land use

A number of strategies listed in the farmland protection report could be useful for gaining support for the agricultural uses on the Boulder Knoll property. The most relevant strategies are those that focus on education and outreach:

- developing events to promote use and appreciation of public open space
- sponsoring or supporting focus groups or public forums to get “buy-in” from the public
- making use of local vocational agriculture program for local education and awareness; involving the vo-ag community in preservation efforts
- using the local resources – land trusts, Audubon etc. – to develop collaborative education programs
- starting a community garden program on town-owned land under the auspices of the parks & recreation department to build awareness of agriculture and the value of flood-plain agricultural soils (e.g., at Three Rivers Park in Woodbury) and supporting local CSAs (Community Supported Agriculture) such as Clark Farm at Flanders Nature Center in Woodbury.

¹ *The Role of Agriculture in the Preservation of Open Space and the Protection of Water Resources: A Case Study of the Pomperaug River Watershed*, Council of Governments Central Naugatuck Valley, 2003

Town of Cheshire Plan of Conservation and Development 2002

The Town *Plan of Conservation & Development* addresses issues of particular significance to the preservation of this property in its discussion of agriculture and the east Cheshire greenway concept. As “development continues to be the single most important threat to Cheshire farms,” the Town should recognize this as a great opportunity to dedicate a portion of available open space to the cause of farmland preservation. The economic benefits mentioned in the Plan may not be possible in this instance given the constraints in place through the Boulder Knoll *Conservation Easement and Agreement* with the DEP. Agricultural use on the property can provide residents with “aesthetic relief” and “cultural identity” through links with Cheshire’s past.

The greenway concept in the eastern part of town is discussed as a major goal in the *Plan of Conservation and Development* and mentioned again in the Management Plan for Boulder Knoll. Besides fulfilling a significant portion of that goal, the preservation of this property also causes us to look at the context of surrounding land uses. In the vicinity of the Boulder Knoll property, there are a number of parcels dedicated to open space, including

North:

- Broad Brook Reservoir – 1,295 acres of reservoir and surrounding land owned by the City of Meriden along Reservoir Road

South:

- DeDominicus property – 185 acres of town-owned, forested open space along Corliss Road, featuring a series of trails available for hiking and horseback riding
- Old Farms Preserve – a 6-acre open space meadow owned by the Cheshire Land Trust (CLT), directly adjacent to the DeDominicus property
- Sleeping Giant State Park – 1500-acres of forests and rock outcrops off Route 10 in Hamden

East:

- Fresh Meadows Swamp – a 44-acre parcel off of Cheshire Road in Wallingford owned by the Wallingford Land Trust located contiguous with 124-acres of Town of Wallingford land to create over 168 acres of open space

West:

- Fresh Meadows property – a 33-acre parcel off of Cook Hill Road in owned by the CLT located contiguous with 124-acres of Town of Wallingford land to create over 168 acres of open space

In addition to these lands, the generalized land use map in the *Plan of Conservation and Development* shows a line of farmland running from the northern industrial zone on West Johnson Avenue down Cheshire Street, Route 70, Tallmadge Road, Coleman Road (which meets up with Boulder Road a short distance from the property), Half Moon Road and ending at Cook Hill Road. The area from Cheshire Street down to Cook Hill Road is a low-density residential zone. 54% of the land in Cheshire (11,578 acres) is classified as *undeveloped* residential; of which 17% (1,921 acres) is used for farming. The concentration of

residentially-zoned farmland is particularly evident along this corridor.² If Boulder Knoll is to be used for agriculture, local farmers can support this use by sharing knowledge and resources in addition to creating a local demand for farm equipment.

Recreation Plans

Connecticut Recreational Trails Plan 2005

Two of the main goals outlined in the Trails Plan are *ensuring the continuity and linkage of trails around the State* (Goal #1) and *utilizing trails as educational media* (Goal #5). In response to the first goal, the Town should determine the potential for connecting the existing Red Trail at Boulder Knoll with other trails in the area as part of a larger initiative to fill in the gaps between trails statewide.

As an educational tool, recreational trails can be used to teach the public about resource protection and management in forests, wildlife areas, wetlands, or agricultural lands. The Plan suggests developing contextual “stories” for trails by bringing together different stakeholder groups that share an interest in preservation (i.e. local historians, naturalists, and tourism officials). The Town has already developed such a background on the Boulder Knoll property in *Appendix A: History* and *Appendix B: Natural/Historical Resources & Terrain* of the Management Plan. The story can be expanded with information from the larger agricultural history of the Town and the geological history of traprock formations in the area. This in turn can be used as an educational tool for visitors and to promote public interest in using the recreational trail.

The Statewide Comprehensive Outdoor Recreation Plan: 2005-2010

The *Comprehensive Outdoor Recreation Plan* (SCORP) supports the potential for developing or maintaining trails and recreational activities at the Boulder Knoll property. It incorporates the same goals set forth by the *Recreational Trails Plan*, but also includes demand surveys of state residents, avid users of recreational facilities, and town officials. These surveys can be helpful in the assessment of recreational uses at the Boulder Knoll property. The most relevant findings from these studies are:

- *running, walking, or hiking* and *biking* ranked in the top 5 activities (out of 30) on a survey measuring relative demand among citizens
- over 90% of respondents in a survey of “avid users” who participate in *trail running* and *bicycling* do these activities several times a week
- *horseback riding* also shares a high frequency among avid users (80% participate several times a week). However, on the citizen demand survey, it ranked lowest among thirty activities for the percent of the population that participates (10%).³

The surveys, which are incorporated into the SCORP, show that the most common recreational activities that can be expected involve hiking or walking and bicycling. Despite

² *Town of Cheshire Plan of Conservation and Development 2002*. p. 56-58.

³ *The Statewide Comprehensive Outdoor Recreation Plan: 2005-2010*. p. 106-107.

the low participation rate for horseback riding indicated in the survey, the use of trails at the nearby DeDominicis property for riding shows potential for similar demand at Boulder Knoll.

Barn Preservation

Preservation of the existing barn should be included in the future plans for this property. Its restoration can be a welcomed incentive to any parties with an interest in performing agricultural activities at the site. The Town should also consider dedicating all or part of the barn to educational activities, which can help attract schools and other groups interested in learning the history of the site. Alternatively, the Town may also consider using this structure in some of its Parks & Recreation programs or making it available to students in the Town's *Artsplace* program for performance and fine arts.

There are many great benefits to restoring this old structure, so it would certainly be in the Town's best interest to look into the cost of renovation and potential future uses in the community. Additional research into the history of the building can be used to identify whether it qualifies for historic preservation grants. The Town should also consider other, creative sources of funding or fundraising to help defray the overall cost.

Coordination with Local Educational Institutions

The history and characteristics of this property and the potential for future agricultural activities should be considered as a valuable resource to local students in science and vocational agricultural programs. The presence of woodland habitats, wet meadows, and unique geologic formations make this property an ideal location for staging field trips in Environmental Science or Earth Science courses. In addition, the Town should consider coordinating with the regional Vo-Ag (Vocational Agricultural) program at Lyman Hall High School in Wallingford, since Boulder Knoll could serve as a great resource to students with an interest in agriculture.

Proposals submitted in response to Request for Proposal (RFP #0607-03)

Proposal submitted by Kerry Deegan

Mr. Deegan's proposal to use a small portion of the land to grow sunflowers as a fundraiser for Cheshire Cancer Crusade and/or the American Cancer Society is a simple, yet effective idea that can benefit a good cause and promote interest in the property. The proposal requests the use of 3 acres in the vicinity of his home at 866 Boulder Road with the potential for an additional 3-5 acres to be made available, if needed. Mr. Deegan also suggests that larger, tall sunflowers can be planted for aesthetic appeal that would promote interest in the property and in his cause as well. Overall, the proposal provides the following potential benefits:

- requires little, if any, municipal resources other than the use of the property
- provides a direct benefit to a notable cause
- makes the property more attractive to visitors

Proposal submitted by Friends of Boulder Knoll

The proposal submitted by the *Friends of Boulder Knoll* (FBK) shows that there is support in the community for agricultural use of open space. It offers an interesting perspective on the potential future use of the property. However, if the concept of the Boulder Knoll Community Farm is to move forward, the following issues should be considered:

- *Friends of Boulder Knoll*, the nonprofit entity that will operate the farm, must give primary consideration to use of the land for *educational* or *preservation* purposes as emphasized by the *Conservation Easement and Agreement* (Sec. 2.d.). The budget submitted in the proposal shows most of the funding going towards staffing and operations of the farming component with only a small percentage of funding directly allocated towards education and conservation.
- The Town should be open to facilitating any farming operations at the property by providing public works resources or startup funds as needed. However, the substantial investment requested by the FBK (\$540,000 over four years) should be regarded with caution. If the project is not sustainable on its own after four years, the Town might be called upon to continue subsidizing its operations at a similar rate.
- FBK requests a ten-year lease to the property. The Town should consider including a condition that provides more flexibility if the operations are not sustainable on their own after a set period of time.
- The proposal may limit the amount of public benefit that the property would otherwise have. While there is potential for residents to rent garden space for affordable prices (equal to those at Bartlem Park), the rest of the land would be dedicated to a community-supported agriculture (CSA) program. The CSA would be partially funded by shareholders, who purchase "shares" of crops for \$400-\$500 per year. Other CSAs mentioned in the proposal offer a further benefit to the community by providing food for hunger relief (Holcomb Farm) or serving a primary function of educating students in agriculture and ecology (Common Ground High School). The

products of the Boulder Knoll CSA would only be available through purchase at a local market or by investing in “shares.”

- It is unclear whether public access would be restricted in areas that are used for agricultural activities. If the CSA is expected to deliver a certain amount of produce to its shareholders, it may need to limit access to this land in order to protect its crops from deer or other intruders.
- If the CSA has a few years with poor crop yields, they are unlikely to continue on a path of increasing “shareholders,” thus requiring revenue from other sources. This risk is not addressed in the proposal.
- Allowing the use of herbicides and/or pesticides, even at a limited capacity (as requested in the proposal), would require oversight to “prevent any demonstrable adverse effect on wildlife, waters, and other conservation interests” as set forth in Section 5 of the *Conservation Easement and Agreement*.
- The proposal includes a plan for extending or replacing the community gardens in Bartlem Park. This should be considered as a reasonable agricultural use for the property, requiring less of the Town’s resources. If managed properly, the community garden program can be arranged without limiting public access for passive recreation.
- The proposal also includes a plan for renting land to agricultural research organizations for agricultural research projects or demonstrations. Establishing partnerships with schools and research groups is helpful in diversifying the use of the land and can provide a means of defraying some of the cost of maintenance.

CT Department of Public Health – Drinking Water Section

Source Water


Protection Unit Comments

Since the conceptual idea for this parcel includes making it open to the public, it is important for the Town to know that this could be creating a new public water system which would require a Certificate of Public Necessity and Convenience. The following link has more information on this process and forms to fill out and return to us:

<http://www.ct.gov/dph/cwp/view.asp?a=3139&q=387326>


Public water systems are regulated by the CT DOH as per the public health code and other regulations, to see what is involved (water quality monitoring and reporting, etc.) visit their main webpage at:

http://www.ct.gov/dph/cwp/view.asp?a=3139&q=387304&dphNav_GID=1824&dphPNavCt_r=#47062



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Welcome to the Drinking Water Section (DWS) website. The DWS is responsible for the administration of state and federal drinking water regulations and is dedicated to assuring the quality and adequacy of our State's public drinking water sources. We provide technical assistance, education and regulatory enforcement to over 2,600 public drinking water systems, which provide drinking water to approximately 2.7 million persons on a daily basis. We maintain a continuing commitment to drinking water treatment and monitoring, drinking water source protection, and consumer education in order to assure and maintain the high standard of drinking water Connecticut's citizens have come to expect and enjoy.




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Hartford, CT 06134

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(860) 509-8000

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- [Drinking Water State Revolving Fund](#)
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Certificate of Public Convenience and Necessity

Development of a New Water Company

If you are developing property that will have an on-site water system, you may be creating a water company. Water companies include various types of facilities served by a common source(s) of supply (i.e. well). These include, but are not limited to:

- residential communities,
- professional offices,
- various businesses, schools,
- day care facilities,
- youth camps,
- food service establishments,
- campgrounds.

In order to determine if the proposed project may result in the creation of a new water company, a "Screening Application for Water Companies" form must be completed and submitted to this office. The information provided by completing the form will be used by the Drinking Water Section (DWS) to evaluate the proposed project and determine whether or not a new water company will be created.

Screening Application for Water Companies

- [Screening Application Instructions](#) (microsoft word)
- [Screening Application Form](#) (microsoft word)

Submission of this application form is a prerequisite to the Certificate of Public Convenience and Necessity (CPCN) Phase I-A application.

If DWS determines that a new Water Company will be created, refer to the information below for the requirements for development of a new Public Water System.

Appendix

For Attachment 2 (Conservation and Public Recreation Easement and Agreement) please contact the ERT Office at (860) 345-3977

**MANAGEMENT PLAN
JACKMAN FARM, LASSEN FARM,
AND BLAUVELT PROPERTY**

Adopted by Town Council 6/28/2005

I. General Property Description

The Lassen Farm (Map 87, Lots 7, 8 & 16) and Jackman Farm (Map 80, Lot 41 and Map 87, Lot 6) are located along Boulder Road in southeast Cheshire. The Blauvelt Property (Map 87, Lot 25) lies generally between Boulder Road and Bluefield Court. While acquired separately by the Town, the three properties' contiguous nature and common features lend well to them being managed under a single management plan.

Acres: Jackman: 37.53 Lassen: 93.5 Blauvelt: 19.5 Combined: 150.53

A general map of the properties is attached as "*Map 1: Jackman Farm, Lassen Farm, and Blauvelt Property*"; Detailed descriptions of the properties' histories and natural & historic features are detailed in Appendix A & B of this plan.

II. Management Goals

General Statement: The mosaic of existing land uses, landcovers, and natural features on the Jackman & Lassen Farms and Blauvelt Property in turn lends these collected properties to a mosaic of open space uses. Further, and unlike many open space properties, because of the properties' recent agricultural uses and extensive existing field/pasture-like conditions, it is appropriate that portions of the properties covered by this plan be actively utilized for agricultural purposes. Therefore, the following management goals shall be recognized by this plan:

1. The Blauvelt, Jackman, and Lassen properties shall be managed for a combination of public access and passive recreation, wetland and upland habitat conservation, and active agricultural purposes.
2. As to public access and passive recreation, this plan recognizes that a major goal and purpose of open space acquisition is for use by the public. Therefore, portions of the properties shall be available for public use.
3. As to wetland and upland habitat conservation, this plan recognizes that inland wetlands and watercourses are an indispensable and irreplaceable but fragile natural resource with which the citizens of the Town of Cheshire have been endowed. Further, preservation of upland habitats helps to ensure a continuance of native upland biological diversity, and provides a balance to wetland preservation. Therefore, efforts shall be made to preserve/maintain existing wetland and woodland areas.
4. As to active agriculture, this plan recognizes that aspects of both farmland preservation and continuance of agriculturally-related activities are valued by the public as contributing to the community's "sense of place" and quality of life. Public farmland preservation assists in continuing farm-based economic activities on the landscape. Further, hay fields & meadows are links to the Town's agricultural heritage, serve as valuable habitat areas, and provide an publicly desired agricultural aesthetic. Therefore, efforts shall be made to engage a portion of the properties in agricultural activities.

III. Permitted Uses

General Statement: Permitted uses shall be as described in *Section 11-30 Open Space* of the *Town of Cheshire Code of Ordinances*, and any applicable conservation easements, including but not limited to the *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP (attached to this plan as "Appendix / Exhibit C"). Specifically permitted uses shall be as follow, and as indicated on the attached map entitled "*Map 2: Jackman Farm, Lassen Farm, and Blauvelt Property - Permitted Uses.*"

A. Jackman Property:

1. Areas not leased for agricultural purposes shall be available for passive recreation, as described in *Section 11-30 Open Space* of the *Town of Cheshire Code of Ordinances*.
2. The northern field and former Christmas tree plantation shall be made available for active agricultural uses, as defined by State Statute, and shall comply with all terms of applicable conservation easements or other deed restrictions. Specific arrangements shall be solicited and arranged for by the Steward, presented for Town Council approval, and subsequently monitored by the Steward.
3. If not utilized as part of an as-of-right agricultural use, wet meadow wetlands may be seasonally cut to maintain wet meadow conditions, or else shall be maintained in a natural state.
4. Other wetlands, and existing woodlands shall be maintained in a natural state.
5. The farm pond may be utilized for public ice skating.
6. Existing farm roads may be posted by the Steward as public trail(s), and/or a trail may be constructed along the property's eastern ridgeline.

B. Lassen Property:

Parcel B (#866 Boulder Road)

1. Shall be available for rental per the *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP.

Parcel C (#810 Boulder Road)

1. Shall be subject to life tenancy and subsequent rental per the *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP.

Parcel D (north of Boulder Road)

1. Field areas, as indicated on Map 2 as "PR", shall be mowed and maintained as a passive recreational expanse for public passive recreation as defined in *Section 11-30 Open Space* of the *Town of Cheshire Code of Ordinances*, and described in the property's *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP.
2. Field areas, as indicated on Map 2 as "A" shall be made available for active agricultural uses, as defined by State Statute, more specifically described in the *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP, and shall comply with all terms of applicable conservation easements or other deed restrictions.. Specific arrangements shall be solicited and arranged for by the Steward, presented for Town Council approval, and subsequently monitored by the Steward.
3. If not utilized as part of an as-of-right agricultural use, existing wet meadow wetlands and watercourses, as indicated on Map 2 as "WM", may be seasonally cut to maintain wet meadow conditions, or else shall be maintained in a natural state.

4. Maintenance shall exclude use of fertilizer, pesticides, herbicides and the like.
5. Woodlands, wetlands, and watercourses, as indicated on Map 2 as "W" shall be maintained in a natural state.

Parcel E (south of Boulder Road)

1. Field areas, as indicated on Map 2 as "A" shall be made available for active agricultural uses, as defined by State Statute, more specifically described in the *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP, and shall comply with all terms of applicable conservation easements or other deed restrictions.. Specific arrangements shall be solicited and arranged for by the Steward, presented for Town Council approval, and subsequently monitored by the Steward.
2. If not utilized as part of an as-of-right agricultural use, existing wet meadow wetlands and watercourses, as indicated on Map 2 as "WM" may be seasonally cut to maintain wet meadow conditions, or else shall be maintained in a natural state.
3. Woodlands, as indicated on Map 2 as "W", shall be maintained in a natural state.
4. Farm roads, existing and abandoned, may be posted by the Steward as public trail(s).

C. Blauvelt Property:

1. Field areas, as indicated on Map 2 as "A" shall be made available for active agricultural uses, as defined by State Statute, and shall comply with all terms of applicable conservation easements or other deed restrictions. Specific arrangements shall be solicited and arranged for by the Steward, presented for Town Council approval, and subsequently monitored by the Steward.
2. If not utilized as part of an as-of-right agricultural use, existing wet meadow wetlands and watercourses, as indicated on Map 2 as "WM", may be seasonally cut to maintain wet meadow conditions, or else shall be maintained in a natural state.
3. Woodlands, as indicated on Map 2 as "W" shall be maintained in a natural state.
4. Farm roads, existing and abandoned, may be posted by the Steward as public trail(s).

As described above, the acreage distribution (rounded to the acre) by permitted use for the subject properties breaks down as follows:

| | <u>acreage</u> | <u>% of total acreage</u> |
|----------------------|----------------|---------------------------|
| Buildings & Yards | 14 | 9 |
| Agricultural | 40 | 27 |
| Wet Meadow | 15 | 10 |
| Wetlands & Woodlands | 44 | 30 |
| Passive Recreation | 36 | 24 |

This acreage distribution by land use is representative of colonial land use distributions in terms of, at least, amount of acreage dedicated to pasture/mowing/tillage vs. acreage left as woodlands. (See Appendix C for further colonial detail.)

IV. Prohibited Uses

Prohibited uses shall be as described in *Section 11-30 Open Space* of the *Town of Cheshire Code of Ordinances* and all applicable Conservation Easements, including but not limited to the *Conservation and Public Recreation Easement and Agreement (OSWA-29)* in favor of DEP for the Lassen Property.

V. Special Considerations

Public educational activities shall be allowed and encouraged. These may include, but are not limited to, volunteer projects to enhance the public's enjoyment of the properties, and opportunities for Cheshire residents to educate themselves about the natural world. These could include compiling wildlife and plant inventories, analyzing the life forms in the streams and vernal pools, placing birdhouses in the less forested parts of the property, making periodic butterfly or bird counts, picking up litter on an annual basis (perhaps in collaboration with the Boy Scouts, Cheshire Academy or Cheshire High School students) and removal of invasive species where appropriate.

Appendix A: History

The 35.23-acre Jackman Farm, which includes one house and some storage facilities, was purchased by the Town of Cheshire, with assistance from the Trust for Public Land, in March 1994 from Ralph and Shirley Jackman. As part of the sale, Mrs. Jackman was allowed to retain 4.7 acres around the house at #800 Boulder Road; the Town has a right-of-first-refusal on this house and associated property.

From the early part of the 20th Century until March 2000, the Lassen Farm was home to a working dairy operation, the town's last remaining dairy farm. The 93-acre farm, its buildings and two houses (#866 Boulder Road, currently being rented out by the Town, and #810 Boulder Road), were sold to the Town of Cheshire by Gilbert and Lorraine Lassen for \$1,603,888.42. The State Department of Environmental Protection assisted with this purchase, in return for an open space conservation easement. As part of this easement, limited agricultural use is allowed on the property. The Lassen family was given lifetime use of the house at #810 Boulder Road.

The 19.5-acre Blauvelt Property was purchased in 2002 for \$175,000. This property was formerly used/leased by the Lassen family to grow silage for cattle.

Because the three properties form a contiguous expanse of 150.53 acres, they are considered together by this plan. *(Also adjacent to this block of properties, a conservation easement covering 18 acres was granted in 2004 to the Cheshire Land Trust by the Giddings family, for a portion of their property at #915 Boulder Road)* Together, the subject properties are a major link in the town's long-range plan to create a "greenbelt" along eastern Cheshire, essentially parallel to the Cheshire – Wallingford border. (The DeDominicis Property is the next existing portion of the greenbelt to the south, Meriden Water Company reservoir land the next existing portion to the north.

Appendix B: Natural/Historical Resources & Terrain

The Jackman property, prior to its ownership by the Jackmans, was known as the Weber Farm and has also been known as Cross Rocks Farm. The Jackmans used the property to raise miniature horses and maintained an evergreen tree farm that is still intact, though overgrown, along with a small shed from which trees were once sold, and an associated maintenance shed. There are old stone walls along a small traprock ridge that runs north-south along the property's east boundary. Residential properties off Wyndemere Court border the Jackman Farm to the north. Though there is some mixed potential use (agricultural and passive recreational), an existing lack of water for crop irrigation severely restricts potential agricultural uses. A neighboring farmer regularly cuts and bales the hay that grows in the fields and uses a small portion of one field for his own crops. He transports the water in for this himself. Preservation/maintenance of the property in its current state would provide for field wildlife habitat and early successional wildlife habitat.

The Lassen Farm, also known as Boulder Knoll Farm, was a dairy farm for nearly all of the 20th century. This remaining portion was the core component of the operation, where cows were housed and milked. Silage for the cows was grown on this property, as well as on the Jackman Farm, the Casertano property (Jarvis Street and Marion Road), the Blauvelt property, and on several other private properties in the area. Farm equipment left behind after the purchase of the property by the Town requires removal prior to future use of the barn structures. Portions of the barn structures have been demolished due to deteriorated conditions, but the main barn structure appears to be intact. The lower portion of the farm, toward the west, has a stream-fed pond that was maintained for the use of the cows. An overflow pipe allows water to spill into an adjoining field that was used to grow silage corn for feed.

Terrain

The parcels are relatively open, with terrain comprised of flat to rolling fields and hills that climb to a minor basalt/traprock ridge running generally along the north-south axis of the combined properties. Wooded portions of the properties generally include the field edges and the slopes of the slight ridge, which runs along much of Cheshire's eastside. Portions of the open fields on all of the properties are wet meadow, which is the fasted-declining type of wetland in New England. As a whole, the fields (wet and upland portions) were used for the growing of hay and silage corn. The fields are currently fallow. A 3/4-mile loop trail has been available to Cheshire residents for hiking since the Jackman Farm's purchase in 1994, as described in the 1994 book TRAILS. The Cross Rocks Formation, a geologically unusual feature studied by several area college/university geology departments, can be found near the western boundary of the former Lassen property. Here, the north-south trending traprock ridge intersects an east-west trending traprock dike. Vague remains of a copper prospecting pit, created in 1711 and soon abandoned, can also be found in this vicinity.

Appendix C: Representative Colonial Landuses

Figure 1: Forest and Farmland Area of Connecticut, 1600 - 1977
(adapted by M. Kasinskas from Irland, 1982)

| Year | Acreage ('000) | | Acreage ('000) | | |
|------|----------------|------|----------------|------|---|
| | Forest | (%) | Farms | (%) | |
| 1600 | 3,010 | (96) | - no data - | | |
| 1700 | 2,130 | (68) | - no data - | | |
| 1800 | 1,644 | (52) | - no data - | | |
| 1860 | 923 | (29) | 2,504 | (81) | - Estimated peak of cleared land in Connecticut |
| 1900 | 1,276 | (41) | 2,312 | (75) | |
| 1977 | 1,860 | (60) | 470 | (15) | |

Figure 2: 1749 Land Use in East Quarter (by acres) – Concord, Massachusetts
(Compiled by M. Kasinskas from data in Donahue, 2004)

| Deeded Landowner | Tillage | Orchard | Pasture | Mowing | Wood | Total | % Wood |
|-----------------------------|---------|---------|---------|---------|------|--------|--------|
| Ebenezer Meriam (Sr. & Jr.) | 5.5 | 0.25 | 9.5 | 21 | 14 | 50.25 | 28 |
| Josiah Meriam | 5.5 | 0 | 9 | 10.5 | 7 | 32 | 22 |
| Nathan Meriam | 7 | 3 | 19 | 24 | 48 | 101 | 48 |
| Samuel Meriam | 5 | 0 | 24 | 13 | 24 | 66 | 36 |
| Samuel Minot | 8 | 2 | 15 | 23 | 44 | 92 | 48 |
| Samuel Fletcher | 9 | 1.5 | 34 | 22 | 22 | 88.5 | 25 |
| John Jones | 13 | 1 | 19 | 29 | 40.5 | 102.5 | 40 |
| Joseph Stow | 12 | 0.5 | 7 | 21 | 28 | 68.5 | 41 |
| Job Brooks, Jr. | 8 | 0.5 | 17 | 22 | 55 | 102.5 | 54 |
| Joshua Brooks, Jr. | 8.5 | 2.5 | 24 | 22 | 14.5 | 71.5 | 20 |
| Samuel Brooks | 12.75 | 1.5 | 20 | 60 | 40 | 134.25 | 30 |
| Thomas Brooks | 13 | 3 | 28 | 27.5 | 31.5 | 103 | 31 |
| Ephraim Hartwell | 24.5 | 2 | 58 | 60 | 23 | 167.5 | 14 |
| Nathaniel Whittenmore | 12.5 | 1 | 47 | 65.5 | 23.5 | 149.5 | 16 |
| | | | | Totals: | 415 | 1329 | 31% |

Figures taken from "Colonial Woodlot Stands in the Southern New England Landscape: Past and Present",
M. Kasinskas 2004, Yale School of Forestry & Environmental Studies

Bauer Park

Madison, Connecticut

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Click on a photo to see enlargement



The outdoor **amphitheater** area is set southwest of the Covered Bridge in the meadow. It can also easily seat 30 students. This area has a great view of the ponds, meadows and forests. (*see Outdoor Classroom*)

Barn

The Barn is a post and beam framed structure, framed of chestnut in an English style. The Barn is as old as the original part of the farmhouse; circa 1840, built on a native granite foundation. Cows were kept in the barn, as was hay in the loft. In 2001, there is a naturalized beehive established in the north double wall of the barn.



Berry Patch

The area named as the Berry Patch is an open clover and fescue grass meadow for the present. The Bishops leased the area for several years in the early 1990's for growing strawberries. The Bauers grew all kinds of crops in these highly fertile agricultural soils.

Boardwalks

There are three boardwalks in the Park in 2001. The Woodland Trail has a short boardwalk. This was built by a Boy Scout, to cross the 8 foot wide stream. There is another boardwalk near the two ponds; it enters a portion of the red maple wetland forest. The third boardwalk connects the Park with the High School property, through the woods and across a small tributary to the Neck River.

Chestnut Program

Two Chestnut research projects were started in 1999 at the Park. One project involves Sandra Anagnostakis, one of the world's renowned researchers on the revival of the American Chestnut. The American chestnut, *Castanea dentata*, was once a major tree component of the forests in the eastern half of the United States, until it was devastated by a European fungus. Dr. Anagnostakis is affiliated with the Connecticut Agricultural Experiment Station, and the American Chestnut Foundation and has set up an experiment researching the sustainability and growth of chestnuts in various soil moisture regimes at the Bauer Park. Another scientist, Phil Gordon, is researching the growth and germination of Chestnuts and deer browsing of seedlings at the Park.



Chicken Coop

During the time the Bauer's farmed the land, there were at least 3 chicken coops on the property. One was removed, one has been burned, and the third has recently collapsed from a heavy snowfall in 1999. There are some plans to build a chicken coop on the property in 2002.

Coldframes

Coldframes were used by the Bauer's to start small seedlings of plants. The Clinton High School construction class students have built 20 feet of coldframes on the south side of the old 2 car garage (which is planned to be converted to a lab/classroom).





Community Gardens

There are two areas of the community gardens. The larger area at the north end of park was established in 1991 and now has about 100 twenty x twenty foot plots. South of the farmhouse are the organic community gardens. Irrigation water is available to the gardeners via a pump and faucet system connected to the pond. Citizens of Madison may rent a spot for the growing season.

Compost Bins

Boy Scouts and Girl Scouts built three compost bins. They are for the Community Gardeners to use for recycling their garden debris.

Covered Bridge

The Covered Bridge located between the two ponds was designed and built by students from the Daniel Hand High School construction class in 2000/2001. It replaced a broken concrete slab which had originally served as a crossing over the stream. It was built using a post and beam construction techniques to mirror building designs of the 1800s, similar to the design style that the farmhouse and barn followed.



Daffodils

Daffodils have been planted by elementary school students from Island Avenue, Jeffrey, Academy and Ryerson Schools near the Bauer Park sign, in the lawn next to Copse Road. Another planting of unusual daffodil varieties is planned for a hillside area on the east side of the Park.

Deer Exclosure

A deer exclosure is constructed near the Woodland Trail, in the meadow, to observe what grazing pressure deer may be exerting on the vegetation in the meadow area. This was constructed in 1999, and will be monitored throughout the years.



Demonstration Gardens

The Demonstration Gardens were first planted in 2000 by graduates of a UCONN Master Gardener program to fulfill their project requirements. The plants are a demonstration of the crops that the Bauer's grew on the farm during their lifetime.

Farmhouse

The original farmhouse was purchased by Erwin Bauer's parents, Constantine and Louisa Bauer around 1904 when they moved from Brooklyn, New York, to Madison. It is estimated that around 1920, the kitchen wing, which included a pantry new indoor plumbing, new bathroom and master bedroom upstairs was added. The original 1840's square house was renovated; the massive stone central chimney was replaced with a brick chimney, the stairway removed and a built in china cabinet installed.



The original floors were covered with linoleum, and the plaster walls were wall papered with one layer of wallpaper. The linoleum and wallpaper were damaged and removed in 2000. The floors were sanded and protected with polyurethane. The walls were painted off white to brighten up the interior and prepare the house for historical displays.

Fishing

Fishing is allowed on the property, as long as licensing rules are followed. A catch and release policy is in effect to maintain the fish population. Removal of all fishing line, hooks and lures is strongly recommended, as multiple uses of the pond and its environs occurs by students and visitors of all ages.

Harvest Festival

Since October 1998, there has been a fall Harvest Festival at the Park. Over 1500 people attend each year, some to experience the farm for the very first time. They enjoy hay rides, music,

petting farm animals, visiting the trails and barns, and just plain enjoying the open space vistas of the land, gardens, forests and ponds.



Honeybees

Honeybees have been living in the walls of the barn for many years. In 2001, new honeybee hives were established just west of the ponds for educational purposes.

Hoophouse

A plastic hoophouse was constructed adjacent to the toolhouse. The concrete walls which serve as a foundation were originally used as a storage and collection area for cow, chicken or horse manure until it was sufficient and the timing appropriate to spread on the vegetable crop areas or hayfields.



Lab/Classroom

The Lab/Classroom is really a two car garage that has been converted for different uses: namely for small groups to study nature in a protected area, have a workshop or a program. Some of the renovation work done in 2000 and 2001 was performed by the Daniel Hand High School Construction class students.

Meadows

Just west of the ponds is a meadow area which is not mowed every year. Differential mowing techniques will be attempted here to create various types of grass habitats, which in turn provide different habitats for mammals and birds.



Native Plant Gardens

The Native Plant Gardens were an idea conceived by a Park Board member to display landscape plants that are or were native to Madison to educate the general public as these plants are not so frequently used for foundation plantings. The plants were purchased from a Madison nursery and planted by the Newcomers Group.

Orchards

The Bauer's planted many types of fruit trees on the hillier portions of the farm. Most of the older trees are apple trees. 45 new dwarf apple trees were planted in the fall of 2000.



Organic Gardens

In 1998 there was a strong request to the Bauer Park Board of Directors to establish an organic gardening area. The area south of the farmhouse was selected as this area was not farmed for at least ten years prior to 1998. Plots are set up for Community Gardens similar to the north gardens.

Outdoor classrooms

There are currently three areas specifically set up for use as outdoor classroom areas. On the east side of the park, near a very large oak tree, is an area with informal benches made with telephone poles. Near the vista on the Woodland Trail is a set of constructed wooden benches capable of seating 30 students.



Parking

Parking is generally restricted to the asphalt area located near the farmhouse. On occasions when a large special event is to occur, cars are parked in the hayfields east of the farmhouse. There are also limited parking spots located near the Community gardens for periodic use by gardeners.

Ponds

There are 4 ponds on the property; 3 on the west side of the park and 1 in the woods just off the Woodland Trail. They are gravel bottomed and are about 4 to 5 feet deep. Warm water fish such as sunfish, bass and pickerel and an occasional American eel can be found swimming in the brownish water. These ponds are not used for swimming. The Bauer's originally dug them for use in irrigating their crops.



Stargazing Platform

The platform was built by a Boy Scout in 2001, for the general public to use. A telescope could be placed on the concrete pad in the middle and users could walk around on the wooden platform without disturbing the telescope's position.

Tool Shed

The tool shed was re-sided by the DHHS construction class students in 2000.

Trails

There are 2 main trails at the park: The Woodland Trail is a 1 mile long loop. It plies through grassy meadows, wooded wetlands and past hillside cliffs and stone fences. The Pond Wetland trail is also a loop, passing by the two ponds, the covered bridge, near bluebird boxes and the forested wetland boardwalk.

Tree Nursery

The Tree nursery was started in the early development stages of the Park in hopes that the Town of Madison could use native trees in some of the landscaping projects around the Town. Many fine dogwoods and sugar maples are growing in the rows set out by a former Tree Warden of the Town.

Volunteering

Volunteers are always welcome to help pitch in at the park for various projects, like plotting out the Community Gardens in the spring, maintaining the Demonstration and Native plant gardens, being a docent for the farm museum, helping with the Harvest Festival in the fall and keeping the trails maintained.

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Connecticut's Iron and Copper

Part 1

By Charles Rufus Harte

From the 60th Annual Report

of the Connecticut Society of Civil Engineers, 1944

Courtesy of the Connecticut Society of Civil Engineers Section

of The American Society of Civil Engineers. Used by permission.

<http://www.csce.org>

THE CHESHIRE COPPER MINES

The records of the Cheshire copper mines leave an investigator in considerable doubt as to what really are the facts.

About 1670, two "adventurers who came from England" are supposed to have opened a mine in a part of Wallingford which later became part of Cheshire. Operations were carried on for some time, but when two of the ships carrying the ore to England for smelting were lost at sea, and with them one or more of the mine officers, those left behind had a quarrel, in which one man was killed. His comrades hastily disposed of the corpse—one account says they dropped it down the shaft—and left for parts unknown. How long the mine remained idle—or for that matter, if it ever was re-opened,—is very uncertain. In 1854 an old mine which had a beech tree two feet in diameter growing over the shaft was:—

"cleared out to the depth of eighty feet. At the bottom was found an old windlass, an iron bound bucket, a large wooden dipper, with handle five or six feet long, a crow bar, picks, drills, hammers, etc., all in a good state of preservation."

(Letter of Geo. R.-Johnson, "from a Meriden newspaper.")

The evidence is circumstantial only, but the existence of all the tools at the foot of the shaft, as if left there in the expectation of using them the next day, fits in with the story of the hasty departure of long before. Under average conditions it would probably take from 50 to 60 years for a beech tree to grow to a diameter of two feet, but with no knowledge as to when it started to grow, it simply shows that operations must have stopped at least 50 or 60 years before 1854.

Again there is a great lack of information. An unsigned article in the *Waterbury Republican* of February 28, 1937, after describing the discovery of the tools, etc., says, "How much the section was worked then is 'not clear,'" and then quotes Judge James R. Lanyon (of Cheshire) as recalling that men worked over the little knoll for three years, from 1880 to 1883, and remembering his father telling of New York men who were spending considerable money and effort to produce ore in paying quantities. To the author, Judge Lanyon said that operations were carried on until 1885 or a little later, after which the buildings were taken down and the machinery sold. . - •

In what was then a part of Wallingford, but now in the southeast corner of Cheshire, one John Parker, in 1711, was reported to have found copper and perhaps other valuable metals on his farm, which was on "Milkingyard Hill". The proprietors of the town, alarmed lest he lay claim to the find, appealed to the "Generall Courte", and at the May session of 1712 the facts and rights were set out as follows:—

Whereas, there is a Copper Mine lately discovered at Wallengsford, in the undivided lands, which appertain to a certain number of proprietors, being the surviving antient inhabitants of said town and the heirs of such antient inhabitants, proprietors, who are deceased, together with such other person or persons who are admitted by common consent and agreement of the proprietors among themselves to a certain proportion of interest and right in the said mines; and more such copper mines or other mines may be discovered within the town

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ship of Wallengsford, either in the undivided lands, or in the lands that are divided and belong to particular persons; all which mines whenever discovered do belong to the aforesaid proprietors by virtue of a covenant or agreement of the inhabitants of Wallengsford made and mutually concluded on among themselves, as also by virtue of a formal and lawful quitclaim from the Govenour and Company of the English Colony of Connecticut in New England in America, under their common seal, settling and confirming the said mines unto the said proprietors and other heirs and assigns forever: And whereas the well managing and improving the said mines will be not only profitable to the proprietors themselves, but also may be of publick advantage * * *.

It is enacted and ordained by the Governor, Council and Representatives in General Court assembled * * *.

That the proprietors * * * shall have power and authority, at all and every time and times hereafter, to improve all the aforesaid mines, and manage all the affairs and business anyways relating to the said mines * * * and are hereby enabled * * * to lease out, demise, and let to farm, the whole or any part or parcel of said mines, * * * for such term or terms of time, as well for such rents, incomes or yearly profits, or other considerations, as they shall think meet.

(Colonial Records, pages 315-316.)

Shortly after this, William Partridge of Newbury and Jonathan Belcher of Boston, merchant, both of the Province of Massachusetts Bay, entered into Articles of Agreement with the town of Wallingford for the opening of mines there, the miners, artificers and laborers connected with them to be exempted from all civil and military. duties and all taxes; the lease to run eight years, with the privilege of renewal for a period "not exceeding 500 years in the whole". It would seem that Parker took exception to the deal, for June 16, 1714:— .

"Ye proprietors agreed to give John Parker teen shillings in case sd Parker be forever hereafter quiet and contented with respect to ye mine money."

For a time the work seems to have prospered. At the October session of the 1721-22 General Assembly, Matthew Bellamy urged:—

"That as your petitioner is living within the township of Wallingford and living very near the place where the miners are at work where there is many of them and especially will be many more and there being no other person within six or seven miles that can well find them entertainment except your Petitioner whereupon your petitioner with the next owners of ye mines prayeth your petitioner may have a lycense by an act of this Assembly to keep *a hous* of entertainment that so your Petitioner may without danger provide for and entertain the miners and others as need may require and your petitioner to be under ye same penalty as other persons that are lycensed by the Assembly Courte".

But evidently matters did not go so well thereafter. At a Proprietors'

meeting held in Wallingford "June ye 23: 1723:—

I"Vbated and agreed yt where as Mr. William Partridge and Mr. Jonathan Belsher: Did formerly hire our mines as will appear by articles more fully described there in: said Patrig and said Belsher not performing ye covenants in said articles conserning said mines: the proprietors do authorize and impower. Capt. John Hall of Wallingford in his Majesties colloney of Connectycutt in New England: to 'render and deliver up said articles on our part: fnd Demand and receive of said Patrig and Belsher or either of yem the Articles on their part reciprocally to be Delivered up according to ye covenants:" (Beach: "History of Cheshire", page 60.)

•The proprietors may well have felt that a smaller group could deal more .successfully with any subsequent lessee, for they appointed a committee of five "to act in their behalf e in all matters and conserns about said mines", and a few months later this committee and the proprietors by their "voat" chose another committee to sign new articles with "Mr. Belsher" of Boston, and others associated with him, from which is would seem that "Belsher" had purged himself of his default. The proprietors were not sure of him at that, for the records carry a vote "that said Belsher shall enjoy his half part of said mines: in case he pays tenn pounds yearly to ye proprietors of Wallingford" who agree not to take any forfeiture proceedings against him if he pays promptly.

'Again there is a break in the records, and that what follows refers to Parker's mine has little more authority than that it is the author's best guess. '

.In October of 1854 Truman Bristol granted Sanderson Smith mining -rights on a 30 acre tract of land at "Copper Valley". Smith failed to meet his obligations, and in September of 1866 Bristol gave Charles Munson and Leonard Pardee the entire and exclusive right of mining, quarrying, digging, and excavating, for minerals and metals :—

"being the same grant he gave Sanderson Smith whose right and privilege ran out and became forfeit by reason of non-payment."

.Prior to this, in 1863, Munson had received another grant from Truman Bristol, and in 1866 he bought land, presumably next the Bristol grants, from David Gaylord, while a year later he obtained from Street Jones such " rights as the latter had in the waters of West Brook, and mining rights on a 50 acre parcel of land, on which he and Pardee were permitted to erect a storehouse and shelter, but not smelting works.

There is practically nothing regarding the amount of ore raised. Munson seems to have worked the mine himself part of the time, and on other occasions to have leased the property. In 1874 Nathan Peck and Isaac Anderson, lessees, agreed to spend \$25,000 "because of the increasing flow of wafer in shafts and levels"; to deepen the shaft somewhat for a water receiver; to extend easterly the drift on the line of the east and west vein; and to install a portable steam hoisting engine.

Munson took great interest in the mine, and personally went to great lengths to make it a success. Ore of a superior quality was obtained, but the shafts, sunk to a depth of more than one hundred feet, and the drifts run from them, encountered water in greater quantity than could be controlled. Munson is said to have sunk \$50,000 of his own money in the project, and various lessees also spent substantial sums, but to no avail, and the leased property eventually reverted to Truman Bristol. However, Mr. George R.

Johnson of Copper Valley said that Mr. Munson, at that time in his ninetieth year, wrote him that he had not lost faith in the mine; that he felt that they not gone down deep enough "to remove the cover off the precious metal". - ;

About the Team

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, soil scientists, foresters, climatologists and landscape architects, recreational specialists, engineers and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - an 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns within the King's Mark RC&D Area - *free of charge*.

Purpose of the Environmental Review Team

The Environmental Review Team is available to assist towns in the review of sites proposed for major land use activities or natural resource inventories for critical areas. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments and recreation/open space projects.

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 site and highlighting opportunities and limitations for the proposed land use.

Requesting an Environmental Review

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of an administrative agency such as planning and zoning, conservation or inland wetlands. Environmental Review Request Forms are available at your local Conservation District and through the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the landowner / developer allowing the Team to enter the property for the purposes of a review and a statement identifying the specific areas of concern the Team members should investigate. When this request is reviewed by the local Conservation District and approved by the King's Mark RC&D Executive Council, the Team will undertake the review. At present, the ERT can undertake approximately two reviews per month depending on scheduling and Team member availability.

For additional information regarding the Environmental Review Team, please contact the King's Mark ERT Coordinator, Connecticut Environmental Review Team, P.O. Box 70, Haddam, CT 06438. The telephone number is 860-345-3977.