

Gunther Property and the Tolland Agricultural Center

Vernon and Tolland, Connecticut



Eastern Connecticut Environmental Review Team Report

Eastern Connecticut Resource Conservation and Development Area, Inc.

Gunther Property and the Tolland Agricultural Center Vernon and Tolland, Connecticut



Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team

Of the

Eastern Connecticut Resource Conservation & Development Area, Inc.

For the

Planning and Zoning Commission, Vernon, Connecticut
and the Inland Wetlands Commission, Tolland, Connecticut

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Report #628

Acknowledgments

This report is an outgrowth of a request from the Vernon Planning and Zoning Commission and the Tolland Inland Wetlands Commission to the North Central Conservation District (NCCD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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

The field review took place on Thursday, April 21, 2011.

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**Reports not received.*

I would also like to thank Charles Gunther, property owner, Ginny Gingras, Tolland Agricultural Center (TAC) Board of Supervisors, Steve Lowrey, Tolland Wetlands Agent, Len Tunderman, Vernon Town Planner and Amanda Fargo-Johnson, ERT Project Assistant for their cooperation and assistance during this environmental review.

Prior to the review days, each Team member received a summary of the proposed project with location and aerial photos. During the field review Team members received additional information and maps. Some Team members made separate or additional field visits to the sites. Following the reviews, 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 towns and landowners. 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 Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing a proposed purchase of the Gunther Property by the Tolland Agricultural Center (TAC) Board of Trustees.

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Table of Contents

	Page
Frontpiece	2
Acknowledgments	3
Table of Contents	6
Summary Highlights	7
Introduction	12
Topography and Geology	22
Soil Resources	25
Wetlands Resources	29
Fisheries Resources	34
Wildlife Resources	38
Invasive Plant Management	44
Archaeological and Historical Review	48
The Shenipsit Trail	50
Renewable Energy Possibilities	51
Appendix	53
About the Team	

Summary Highlights

The Tolland Agricultural Center's (TAC) acquisition of the Gunther Property would allow the TAC Board to expand current programs such as hiking trails, nature areas, festivals and fairs and to explore new programs such as organic food production and community gardens. The synergistic relationship of the TAC Property and the Gunther Property will accomplish maintaining open space in the Towns of Vernon and Tolland, providing protection of water quality and quantity in the watershed, improving wildlife and aquatic habitats, protecting cultural resources, providing an enhancement to the relocation of the Shenipsit Blue-blazed trail and providing possibilities for demonstration areas for renewable energy.

Topography and Geology

The topography of the Gunther parcel is generally flat with two distinct levels and results from the shape of the sand and gravel deposits formed by meltwater streams at the end of the last Ice Age. The Gunther homestead and barns are built on the upper level and the lower level has been farmed for hay. Both levels have been disturbed by past activities, including some gravel removal in at least one location.

Bedrock is not exposed in the immediate area, but it is exposed in the hills to the southeast of the site.

The Littleton Schist is exposed in a road cut in the industrial park just to the east of the Gunther



Property. The Littleton Schist is a silvery gray quartz-muscovite schist that may contain garnets and staurolite crystals.



Glastonbury Gneiss underlies all of the Gunther Property and this is covered by sand and gravel left by Ice Age meltwater streams. It is this sand and gravel that was intermittently removed from the area. A deposit of sand and gravel is a valuable resource when the deposits are coarse enough, but some of the sand observed appeared to be fine grained and silty which would have limited economic value. The soils in the lower area were described as “fertile, thick”, “dark brown and loamy” which may have formed as a delta at the edge of a shallow meltwater pond during the last ice age.

Field observations of the topography, vegetation and farming practices suggest that the water table is very near the surface on the southern half of the property, at least seasonally. The water table on the northern portion is likely 20 feet below the surface and the sand and gravel make a good aquifer that would likely provide high-yielding water wells if developed.

Soils

The soils on the property have a variety of parent materials including glacial till, glacial outwash, alluvium and windblown (eolian) deposits. Soils on the open land on both the Gunther and TAC properties were evaluated for crop suitability.

The soils in most of the open areas are suitable for pasture, hayland and cropland. Seasonal moisture is a moderate limitation in the lower 1/3 of the hayfield. Vegetable crops will need supplemental water.

The hillside (old borrow pit area) has sandy soils and is suitable for grass, trees or educational activities. Because of droughtiness and slope it is less suitable for vegetable crops.

The approximately 2 hour field on the top of the hillside has good potential for education and demonstrations, and agricultural use. It has good accessibility and is close to buildings and water and power. The soils are suitable for vegetables, hay, or orchards. It is also suitable for greenhouses and high tunnels.

The old paddock area could be restored to a small pasture, orchard or recreation area with soil improvements. The area near the main residence with gardens has good soils and would be an excellent area for demonstration gardens or a food pantry garden.

Current exhibits at the TAC Property such as the organic vegetable garden or turf demonstration area could be relocated to areas on the Gunther Property. This would provide more flexibility for events at the TAC and avoid using areas of Gunther Property for parking. Soils at the Gunther Property have good permeability and less surface compaction than those at TAC. The recharge provided by the property is beneficial to water quality and quantity in the watershed.

Wetland Resources

Approximately 3.6 acres of the Gunther Property are mapped as wetlands. These wetlands are part of the floodplain for Gages Brook. A very small portion of this area is part of the larger hayfield. By viewing aerial photographs from 1934 to 2004 it can be seen how the wetland and floodplain were cleared and used for agricultural purposes. The floodplain wetland was altered by channelization designed to drain the wetland. It is suggested that a more precise wetland soils mapping be prepared for the southern portion of the Gunther Property. It is thought that there will be an increase in the wetland soil extent over what is currently shown for soils mapping.

An educational opportunity is to let the hayfield revert to wetland growth through natural succession, although there would be a decrease in the overall hayfield acreage. Any reclamation of wetland area would also increase habitat for common wetland forest inhabitants such as deer and raccoons.

There is currently a Wildlife Habitat Incentive Program (WHIP) project on the TAC Property that is seeking to restore natural wetland habitats.

Fisheries Habitats

Gages Brook is a small first order headwater stream that empties into Walker Reservoir located within the Tankerhoosen River Watershed. Gages Brook is incised as it flows through the TAC Property and this has resulted in an unstable channel that continues to downcut, erode its streambank and lose contact with its floodplain. Upper sections in the Industrial Park and Gunther Property have been impacted by man-made alterations. Increases in impervious surfaces in the watershed have probably caused or exacerbated stream incision and streambank erosion.

An electrofishing survey conducted in 1989 by DEP staff has documented that Gages Brook is a coldwater resource that supports native brook trout population as well as blacknose dace and white sucker. The small pond on the TAC Property has no fisheries resource value.

Recommendations include implementation of an aggressive invasive species vegetation removal program, development of an educational trail along the brook and wetlands explaining the types and values of the brook, wetlands, flora and fauna, and enhancement and restoration of the brook habitat to enhance instream fish habitats.

Wildlife Resources

The existing wildlife habitat on the two properties includes hayfields, forested field edge and wetlands. Early successional habitats including fields, shrublands, grasslands and meadows are rapidly declining in Connecticut. Agricultural fields can provide valuable early successional habitat for many wildlife species, especially grassland specialist birds. If the existing hayfields are kept in agricultural use there should be a mowing schedule that accommodates grassland bird nesting cycles and allows reptiles such as box turtles to forage.

There are management options such as converting the hayfield to native warm-season grasses to benefit those grassland specialists that require contiguous unbroken areas to successfully reproduce. Another option is to manage the field to benefit wildlife in general by allowing it to convert to meadow habitat with a mix of grasses and flowers.

The forested field edge and the Gages Brook wetland area should be managed to treat and remove invasive species because they reduce habitat diversity.

The small pond on the TAC Property has limited wildlife habitat value due to the lack of vegetation. Wildlife value can be increased with plantings or allowing vegetation to grow up by not mowing around the pond.

One potential vernal pool was located during the site walk and it would be beneficial to conduct a spring survey at the pool to document all breeding species.

Educational components may be added such as bluebird nest boxes with educational signage. If additional trails are developed care needs to be taken to prevent disturbance to

wildlife. Trails should not bisect the grass fields and if dogs are allowed they should be leashed so as not to disturb or kill small mammals and ground nesting birds.

Invasive Plant Management

Priority areas for invasives control are trail sides, areas being interpreted for the public as ecological landscaping and within areas slated for control the priority shrubs are large ones in the sun or at the forest edge.

Viburnum Leaf Beetle damage was observed in woods beyond the pond on the TAC Property. There is no reasonable treatment available at this time so no additional plantings of Viburnum are recommended.

The shrubby triangle-shaped area east of the Gunther hayfield should be maintained as early-successional shrubland.

Management recommendations for the Gunther Property include:

- doing something about the Bedstraw that has infested the hayfield
- Consider mowing the triangle shaped former livestock holding area to keep and encourage the shrubby wildlife habitat while being aware that there are many invasives in this area.

Management Recommendations for the TAC Property include:

- In streamside areas Garlic Mustard is the most important invasive species to control.
- Erosion problems should be addressed.
- Any plantings should be fast growing and deer resistant.
- When the WHIP contract is complete in the butterfly garden/pond and woods road area there should be follow-up.
- Although the woods beyond the pond area is comparatively free of invasives plants there should be monitoring and removal of garlic mustard and scattered invasives such as Japanese Barberry and multiflora rose.
- The native plant labeling project should continue.
- The fence rows (even though they contain some invasives) that border the TAC property and Gunther hayfields should be retained and a section could be selected as an invasive species educational site and the plants labeled.
- Invasives could be removed in the fence row areas where they are crowding native plants.

Archaeological and Historical Review

The area possesses a moderate-to-high sensitivity for archaeological resources of pre-Contact Native American sites but the proposed uses of the Gunther Property and the TAC Property will not likely have any adverse effects on cultural resources. There are

many educational opportunities that could highlight Native American lifeways and horticultural activities.

The house and barn on the Gunther Property appear to be eligible for the State Register of Historic Places. This could provide funding opportunities for restoration projects associated with maintaining the barn.

The Shenipsit Trail

A portion of the Shenipsit Trail, part of the CT Blue Blazed trail system, has been recently relocated through the TAC Property. Acquisition of the Gunther Property would present an opportunity to continue the trail across the Gunther piece highlighting its historic, environmental and agricultural features.

Renewable Energy Possibilities

- Solar power-photovoltaic would be possible to install on the south-facing roof of the TAC office building. Further information may be found at: http://www.cl-p.com/Home/SaveEnergy/GoingGreen/Renewable_Energy_Credits/
- There does not seem to be a need currently for solar power-thermal for hot water at this time. If there is a need to significant year-round use of hot water there should be plenty of roof space for a solar thermal system.
- The open fields (Gunther Property) may be suitable for a wind turbine but there does not seem to be enough electric demand on-site to justify the expense of a wind turbine.
- If use of the on-site buildings changes to require year round heating and cooling it is recommended to investigate a ground source heat pump system because of the available open fields could make it economical.

Introduction

The Vernon Planning and Zoning Commission and the Tolland Inland Wetlands Commission have requested assistance from the Eastern Connecticut Environmental Review Team (ERT) in providing assistance in reviewing a proposed purchase of the Gunther Property by the Tolland Agricultural Center (TAC) Board of Trustees.

The Gunther Property is adjacent to the Tolland Agricultural Center (TAC) on Hyde Avenue in Vernon. The TAC property is approximately 30-35 acres in size and was purchased from the Town of Vernon from their Town Farm property more than fifty years ago. TAC is a non-profit, self-supporting organization that provides “an environment where agricultural production, education, ecological landscape education and leadership education is available for all ages and all citizens of the State of Connecticut.” Eight structures have been developed on the property which provides office space for the Connecticut Cooperative Extension System, the North Central Conservation District, the Master Gardener Program, and the SARE program. The grounds are used to host such programs as school Envirothons, the Tolland County 4-H Fair, UCONN Parenting Programs, the Connecticut Sheep and Wool Festival and the Boy Scout Jamboree. Other projects located on site include rain gardens, a seasonal labyrinth, turf demonstration area, organic vegetable garden and a woodland trail.

The Gunther Property is four (4) parcels located to the east of the TAC property on Hyde Avenue. The parcels are located in both Vernon and Tolland. (See location maps.) The parcels in Vernon include Parcel #68, which is .38 acres in size and contains several buildings, Parcel #58 is 4.57 acres in size and is currently a hayfield, and Parcel #80 which is 3.4 acres in size and contains buildings and a hayfield. Parcel #269 is in Tolland and it is 14.3 acres in size and is in hayfields with some woodland and wetlands. The total acreage for the Gunther Property is 22.65 acres.

The Gunther Property has been used for agriculture for about 100 years. It was a dairy farm until 1963 and most recently used for horses, beef and pigs. It stopped being a working farm in 1983 while the fields continued to be hayed on a yearly basis. Adjacent land uses include residential, commercial and industrial.

Objectives

The purchase of the Gunther Property would allow the TAC to expand their existing programs and to explore new programs such as organic and community gardens while maintaining open space in the Towns of Vernon and Tolland.

The ERT review will allow the TAC Board to identify constraints and opportunities for program use. The TAC committee formed to explore purchase has identified potential uses that may include but are not limited to: use and outbuildings for offices or resident farmer, demonstration farm, Christmas tree farm, outdoor theater, farmstand, greenhouse, community supported agriculture, incubator farm, and environmental education. The ERT was also asked to identify and discuss agricultural resources on the Gunther

property in relation to the adjacent TAC property. Information would also be used to apply for funding.

The ERT Process

Through the efforts of the Vernon Planning and Zoning Commission and the Tolland Inland Wetlands Commission this environmental review and report was prepared for the Towns of Vernon and Tolland.

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

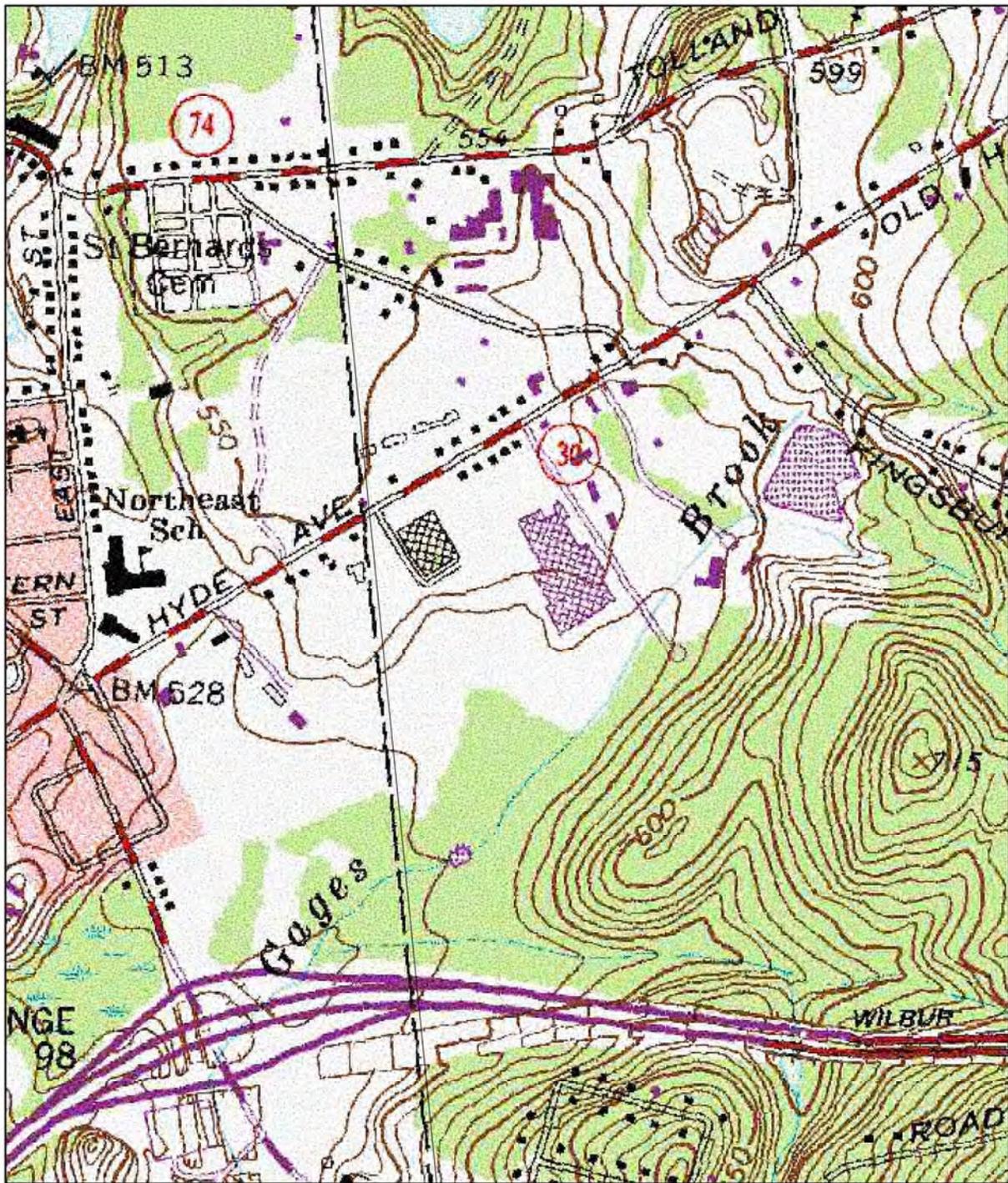
The review process consisted of four phases:

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 April 21, 2011. Some Team members made separate and additional field visits on their own. 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.

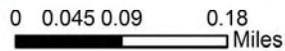
Gunther Property/ TAC Property Site Map



The Connecticut Environmental Review Team



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. April 2011.

Vernon & Tolland, CT



Gunther Property/ TAC Property Color Aerial Map



The Connecticut Environmental
Review Team



0 0.03 0.06 0.12
Miles

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the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
April 2011.

Vernon & Tolland, CT



Gunther Property/ TAC Property Aerial Map



The Connecticut Environmental
Review Team

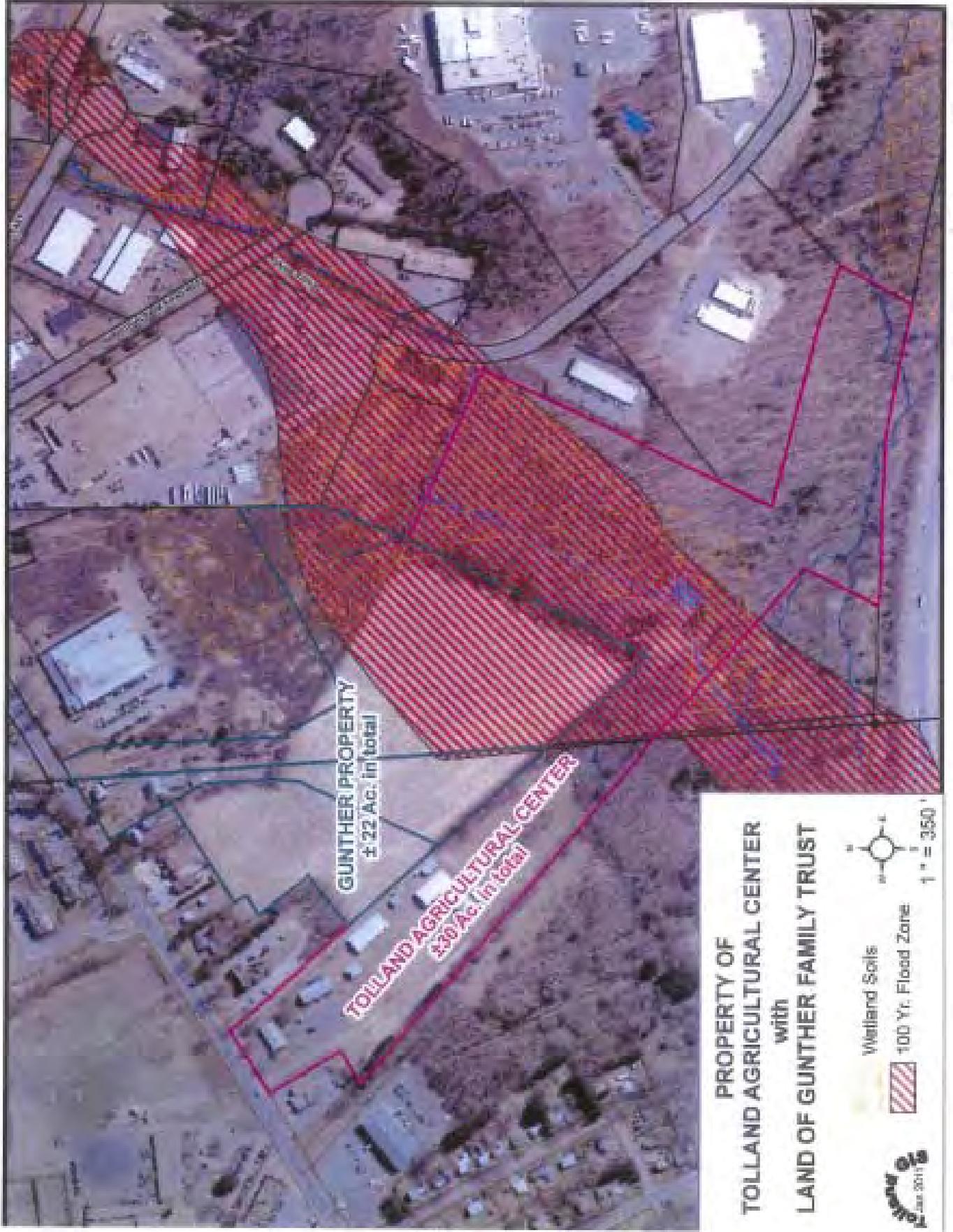


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Miles

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It contains no authoritative data.
April 2011.

Vernon & Tolland, CT





GUNTHER PROPERTY
± 22 Ac. in total

TOLLAND AGRICULTURAL CENTER
± 30 Ac. in total

**PROPERTY OF
TOLLAND AGRICULTURAL CENTER
with
LAND OF GUNTHER FAMILY TRUST**



Wetland Soils
100 Yr. Flood Zone



Potential Usage of Gunther Property by TAC

The committee divided the Gunther Property into four zones and listed current and future uses.

Frontage: No current use by TAC

Future:

- House CFBA office space/environmental organizations
- Housing and land usage for startup farmer
- Other ag structures (farm stand, barns, greenhouses)
- Access to farmland

Hillside: No current use by TAC – used for hay by local farmer

Future:

- Demo farm
- Tillable
- Parking for 3-4 two day events
- Christmas trees on slope
- Public access/participation
- Observation/outdoor theater
- People's garden

Ag Zone Current:

- Sheep dog trials

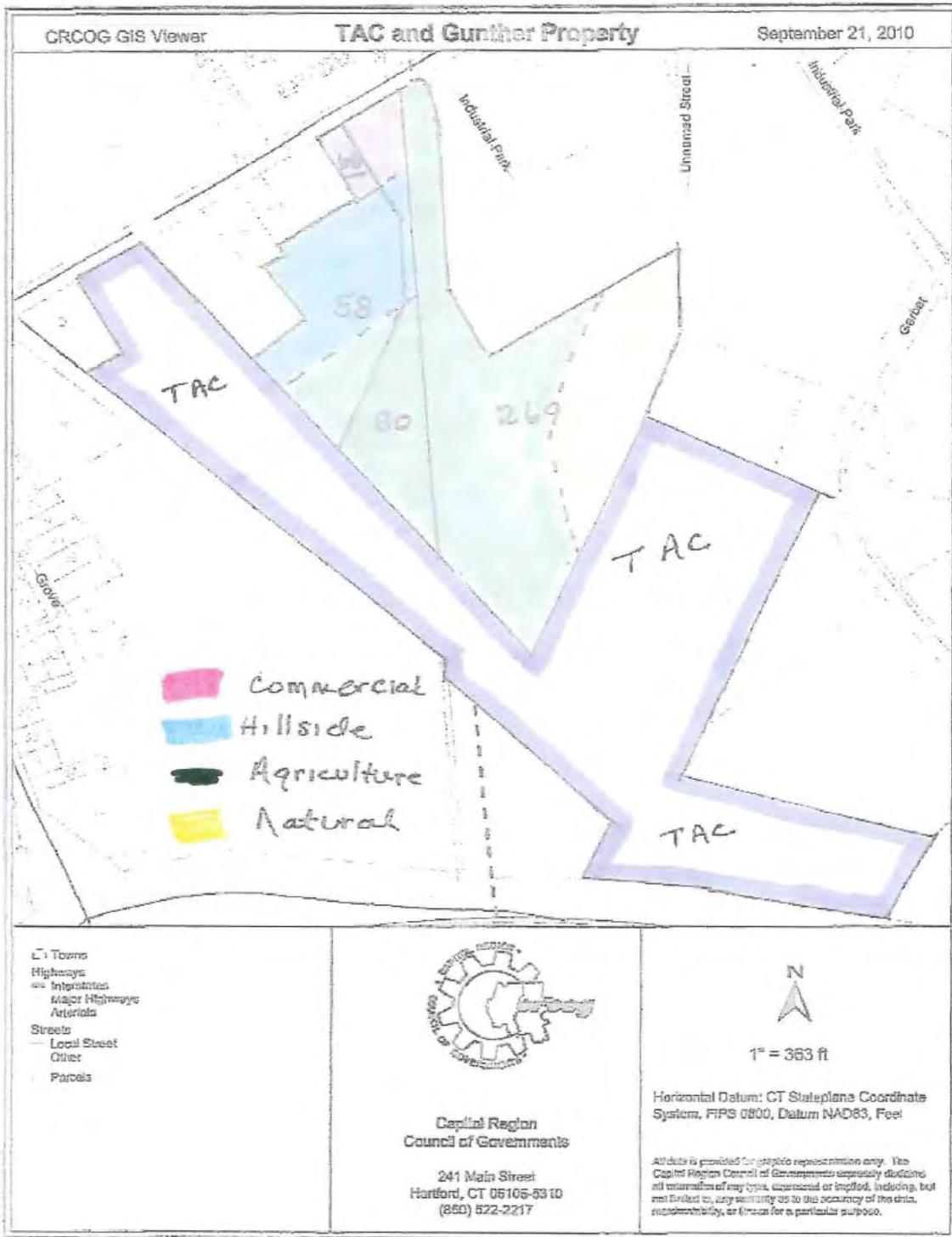
Future:

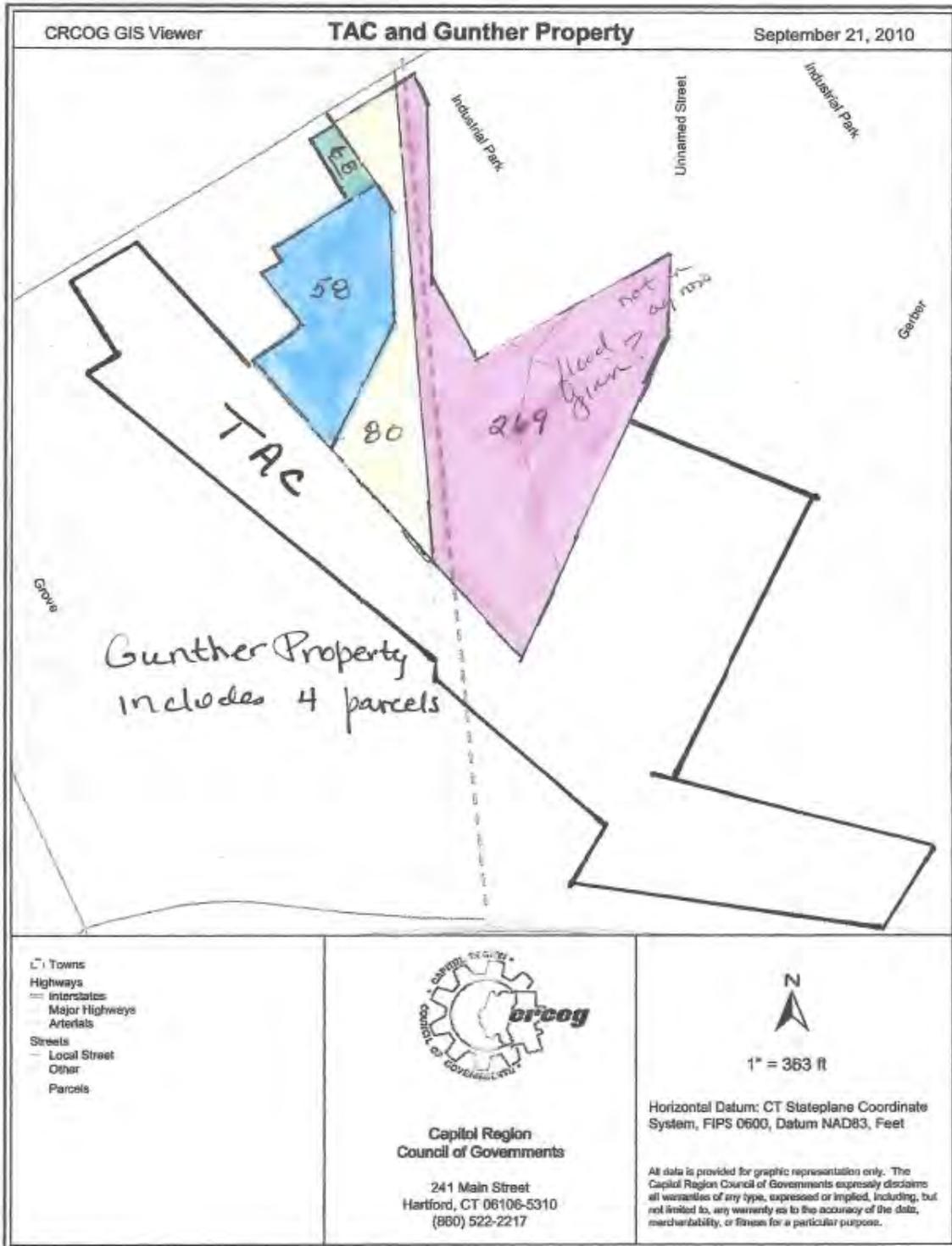
- Community supported ag
- Incubator farm
- Ag demo
- Parking
- Environmental education

Brook No current use by TAC

Future:

- Environmental protection
- Buffer
- Environmental education
- Possible recreation
- Outdoor education center
- Blue Trail (?)

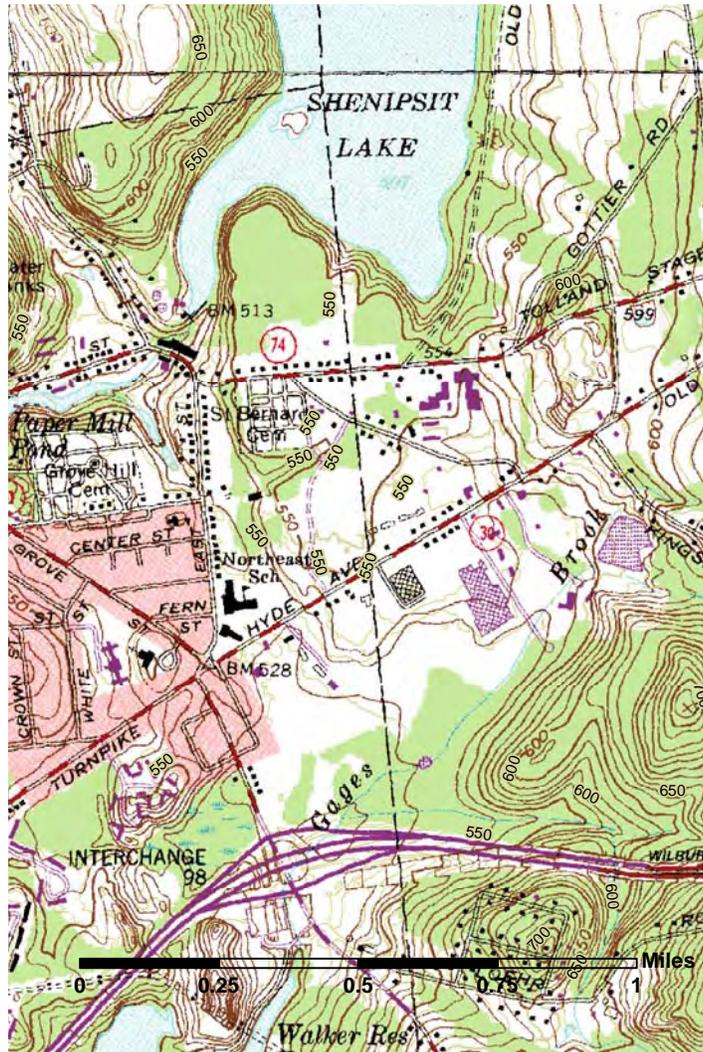




Topography and Geology

Topography. The topography of the Gunther parcels is generally rather flat, but not featureless (Figure 1). Two distinct levels are easily seen: a flat upper level (Figure 2a) with an elevation just lower than 550' and a lower level with elevations ranging between 530' and 520' (Figure 2a and c). A gentle slope connects the two levels (Figure 2a and b). This topography is inherited from the environment in which the underlying sand and gravel were formed about 16,500 years ago. The Gunther homestead and barns are built upon part of the upper level. The remainder of the upper level and the lower level are currently farmed for hay. Both levels have been disturbed over the years by past farm activities, including gravel removal in at least one location.

Figure 1. Topographic map a portion of the Rockville Quadrangle showing the location of both the Tolland Agricultural Center and the parcels under consideration for purchase (rectangle shows approximate area, but *not* property lines). Notice that the flat area extends all the way to the southern edge of Shenipset Lake. The topography of hills to the southeast and northwest are bedrock controlled. The rest of the topography results from the shape of sand and gravel deposits formed by meltwater streams at the end of the last Ice Age. Near vertical dashed line is the boundary between the towns of Tolland to the east and Vernon to the west (the extreme northwest corner of the map is in the town of Ellington). Contour interval = 10'.



Geology. Bedrock (ledge) is not exposed in the immediate area; it is exposed, however, in the hills to the southeast. There outcrops and large glacial boulders of Littleton Schist may be found. The Littleton Schist is a silvery gray quartz-muscovite schist that may contain garnets and staurolite crystals (porphyroblasts). The interested reader may see the Littleton Schist exposed as road-cut outcrops (Industrial Park Road/Gerber Drive) in the industrial park just to the east. Just west of the foot of these hills is the contact of the Littleton Schist with the older Glastonbury Gneiss. The Glastonbury is covered by sand and gravel left by Ice Age meltwater streams and the gneiss does not crop out in the immediate area (it may be seen as road-cut outcrops along I-84 west of the on-ramp from Rte. 31). The Glastonbury Gneiss, however, underlies all of the



a.



b.



c.

Figure 2. a. Flat upper topographic surface is seen on the left (north) just above Environmental Review Team members; lower surface is to the right. Note the flatness of the surface and then a distinct topographic break. b. Topographic slope between surfaces. ERT members are standing at the slope break. c. Lower gently sloping surface. Note darker green area in middle of image: that was an area where a small amount of gravel was removed according to statements made by Mr. Gunther at the meeting. Bush on left of image is same bush as seen in the middle of Figure 2b.

parcels that are being considered for purchase. The Glastonbury Gneiss has a granitic composition.

According to statements made by Mr. Gunther (who grew up on the parcels) sand and gravel was intermittently removed (mined) from the area near the slope break (see Figures 1 and 2). Indeed, sand and gravel (with rounded pebbles) were seen at various places on the upper

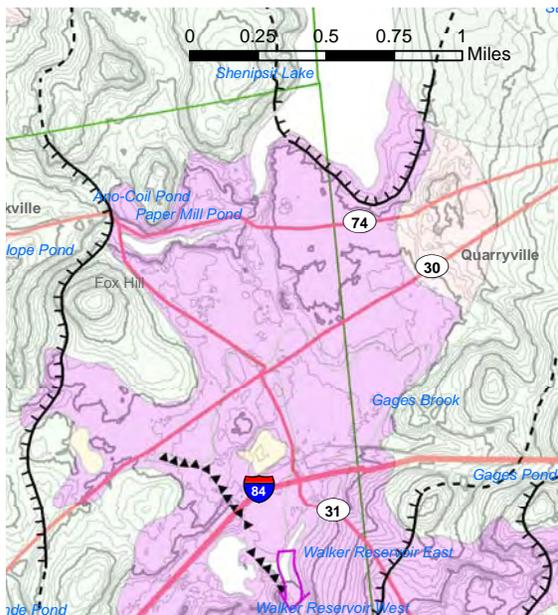


Figure 3. Topographic map on which the extent of several features formed during the melting of the last Ice Age glaciers are mapped. Heavy orange line is I-84; thin orange lines are Rtes 30 and 74. The area colored magenta shows the extent of deposits of sand, gravel and silt in and in and along the margins of a small temporary meltwater lake. Arrow at bottom of map shows spillway that formed when the pond drained. Pale gray and green areas are covered by glacial till. The hachured lines show the position of the ice margin at various times during the melt-back of the glacier. The line of triangles shows the location of an esker southwest of the parcels. Green lines are town boundaries. Shenipsit Lake is the white area on the north-central edge of the map (under scale bar). Note this map shows

about the same area as Figure 1. Map from Stone and others, 2005. Topographic contours generated by LIDAR technology and are somewhat affected by the tree canopy. Hence the contours are not as streamlined as in Figure 1.

surface where the soils thin and had been removed. Mr. Gunther also stated that the lower area contained thick “fertile” soils that were dark brown and loamy (no pebbles?). This information along with analysis of the topography suggest that the surficial deposits in this area formed as a delta at the edge of a shallow meltwater pond. The pond formed because left-over ice formed a temporary dam down-stream in the valley. The upper surface was the delta top and hence represents the approximate lake level during its formation. The “fertile” soils are deposits on the pond bottom of silt and clay carried by the glacial stream that fed the pond. The northern edge of the pond was up against the ice (head of outwash) which was located in the modern day Shenipsit Lake basin (see Fig. 3; Stone et al, 2005). (No sand and gravel was deposited there because the ice was in the way.)

The last Ice Age was at its coldest about 20,000 years ago and glacial ice extended southward to Long Island (ice was about a mile thick in Tolland at the time). Global warming resulted in melting of the ice and gradually the southern front of the ice melted back ward (north), uncovering the state in a step-wise fashion from south to north. Tolland finally became ice free between 16,000 and 16,500 (radiocarbon) years ago. It was during that time span, when the active ice margin lay just to the north and left-over chunks of ice lay scattered around south of the active ice that the temporary lake formed in the area of Tolland south of Shenipsit Lake. The lake may have existed for only a couple of years before the ice dam melted causing the pond to drain.

Resources. A deposit of sand and gravel is a valuable resource when the material is coarse enough: i.e. the more gravelly the more economic the deposit. This particular deposit is the distal portion of the delta and hence might have been deposited in lower energy conditions (slower currents) than proximal portions of the delta. Some of the sand observed at breaches of the thin soil cover on top of the delta was very fine-grained and possibly silty. Such sand is of limited economic value. It is possible that much of the deltaic deposit at this location, particularly the deeper portions), is composed of fine-grained material.

Groundwater. Field observations of topography, vegetation, and farming practice suggest that the water table is very near the surface on the southern half of the property, at least seasonally. The water table on the northern part of the property, where elevations are higher, is likely 10-20 below the surface. The sand and gravel make a good aquifer that likely will provide high-yielding water wells if developed.

Reference:

Stone, J.R., Schafer, J.P., London, E.H., DiGiacomo-Cohen, M.L., Lewis, R.S., and Thompson, W.B., 2005, Quaternary Geologic Map of Connecticut and Long Island Sound Basin (1:125,000). U.S. Geol. Surv. Sci. Invest. Map # 2784.

Soils

Parent Materials

The soils on the properties have a variety of parent materials.

In a December 2002 report accompanying a high intensity soil survey for the Tolland County Agriculture Center (TAC), Donald Parizek, NRCS soil scientist includes this description. Adjacent areas of the Gunther property have similar parent materials.

“ The parent materials, in which the soils formed are diverse on the property, they include glacial till, glacial outwash, alluvium and wind blown or eolian deposits. An outwash plain occupies the western portion of the property. This is composed of coarse textured stratified sands and gravel deposited by glacial melt waters. These areas were then capped with loamy wind blown deposits as the ice sheet retreated from the barren landscape. The contrast between these two parent materials can be seen in the outwash soils. The upper horizons are brown and loamy while the lower horizons are sandy and red. The brown colors have their origin in the metamorphic gneiss and schist rocks of the Eastern Highlands of the state while the red sandy outwash has its origin in the sedimentary rocks of the central lowlands of the state. Glacial till soils are found on the ridge on the eastern side of the (TAC) property. This is a sandy friable ablation till derived from gneiss and schist rock types. Glacial till is a mixture of particle sizes from clay to boulders that were transported and deposited by glacial ice. The rock fragments found in these soils are angular in shape. Alluvium is found along the two perennial streams that bisect the property. This material is transported and deposited by flowing water. This material is loamy or sandy and lacks gravel and cobbles in the upper horizons. The floodwaters do not have sufficient velocity to transport these rocks. Buried horizons or organic matter are common in the alluvial soils.”

Soils

Soils on the open land on both properties were evaluated for crop suitability (see attached photo for locations). Soils occupying the wooded portion of the eastern side of the TAC property are primarily limited by wetness, slopes, and stones and are better suited to other uses such as education and trails.

Ag Zone and adjacent TAC grounds (#1 on the following photo):

The lower (approx. 1/3) of the field has moderately well drained sandy soils (Ninigret series). Ninigret soils may have a seasonal high water table for periods between September and May. There is evidence of a seasonal high water table at around 18" in the soils in this part of the field. They have a loamy cap of 12 to 24 inches. The thickest cap is in the soils at the southeastern-most edge, and gradually becomes thinner towards the northwest. The upper 2/3 of this field has well drained Agawam soils. These soils show no evidence of a water table within 5 feet of the soil surface. They have a loamy cap of about 12 inches over gravelly sand and sand layers. The soils in this zone are suitable for pasture, hayland, or cropland. Seasonal moisture is a moderate limitation on the Ninigret soils. Vegetable crops on either soil will need supplemental water.

Hillside (#2 on the following photo):

This part of the Gunther property looks like the remains of an old borrow pit. The soils here are sandy throughout. The area is suitable for grass, trees, or educational activities. Droughtiness and slope make it less suitable for vegetable crops than other areas on the properties.

At the top of the hillside (#3 on the following photo) is an open field of about 2 acres in size. The well drained Agawam soils in this field have a loamy cap of about 18" over sands and gravels. Accessibility, nearness to the farm buildings, and proximity to water and power give this area good potential for an education, demonstration, or agricultural area. The soils are suitable for vegetables, hay, orchards, greenhouse or high tunnel and possible uses for the area are a community garden, vo-ag program, food pantry garden, or demonstration plot (IPM, water management, organic practices, etc.).

Old paddock (#4 on the following photo):

This area is rough, sloping, and has a lot of debris, but the soils are deep and sandy. It should be possible to smooth it out and restore it. It is less suitable for vegetable crops than other areas on the property, but with soil improvements it could be restored to a small pasture, orchard, recreation area, or other use.

Alongside the main residence and pool there is a vegetable garden of about .2 acres (estimating from aerial photo) (#5 in photo). It has good soils consisting of a loamy cap greater than 18" over sand. Like area #3, here the soils are good and there is easy access and proximity to the farm buildings, water and power. The plot would be suitable for any number of demonstrations or a food pantry garden.

Current exhibits at the TAC property like the organic vegetable garden or turf demonstration could be relocated to either area 3 or 5, or possibly 1, providing more flexibility for fairs and other events at the TAC and avoiding using open areas on the Gunther property for activities like parking. Soils at the Gunther property have good permeability and less surface compaction than those at the TAC. The recharge provided by the property is beneficial to water quality and quantity in the watershed.



Wetland Resources

The plan proposes the purchase of 22.65 acres known as the Gunther property immediately adjacent east-northeast to the Tolland Agricultural Center (TAC). This property is a generational family farm which has been reduced in size from its original 60± acres over time by the selling off of acreage.

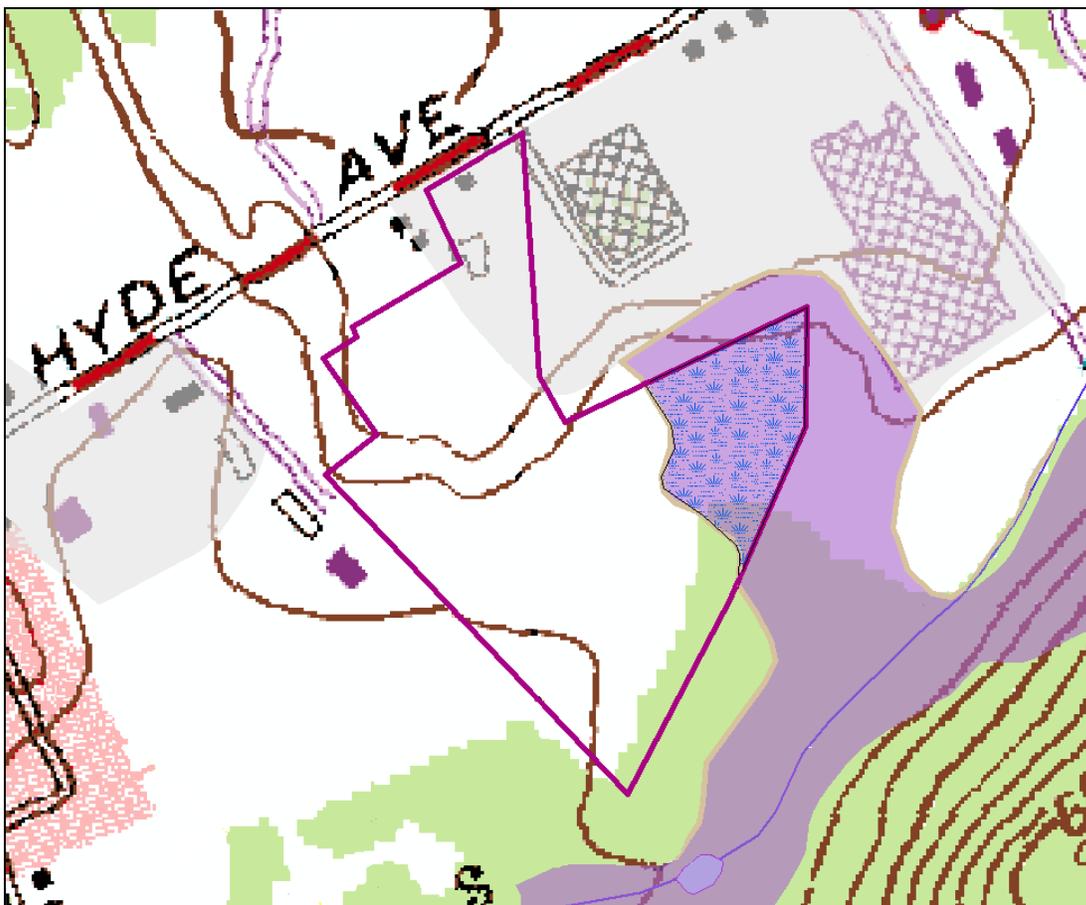
At 22.65 acres this property is small with only a small percentage being tangent to mapped hydric soils which we recognize as wetlands.

The property is currently used as hay field. It is primarily open land (non-treed) with a minimum of deciduous trees. The existing trees are located predominantly near the existing structures, including house and barn, in close proximity to the road, and along the perimeter of the property.

The proposed primary use for the land is educational. The acquisition will provide the TAC with the opportunity to expand on the overflow of its land-based agricultural education functions that it now takes part in.

Wetlands and Watercourses

Of the 22.65 acres being reviewed, approximately 3.6 acres (~16 per cent) is mapped as wetland soils. These wetlands are contiguous to, and are a part of, the floodplain for Gages Brook which flows east-southeast about 550 feet from the wetland. (See color graphic below)



In the graphic above the purple line represents the approximate boundary of the ~22.3 acre Gunther property. The marsh symbols on the eastern-most section of the parcel depict the 3.6 acres of mapped wetland. Gages Brook, seen as a thin blue line, flows from the center of the right hand side of the image to the center of the bottom of the image passing through a small pond on its flowpath. The existing TAC offices and barns are below (south) of the word Hyde in the Hyde Ave. street name.

(Source: USGS 7.5 minute topographic map, Rockville Quadrangle)

Of the 3.6 acres of wetland only a sliver, or about .3 of an acre, is shown today as being mapped as wetland soil and used for agricultural purposes. This small portion is currently being used as hayfield. Except for this sliver of property the wetland area shown with the blue marsh symbol above is, for the most part, reverting to its original wetland/floodplain vegetation. At the time of the review it was flooded with standing water and dominated by a scrub-shrub vegetative cover.

We are fortunate to have comparative aerial photographs dating from 1934 to 2004 which show the land use that has taken place in this vicinity over those 70 years. Thus in the two photographs that follow we can see the extent to which wetland and floodplain was cleared and used for agriculture purposes before the

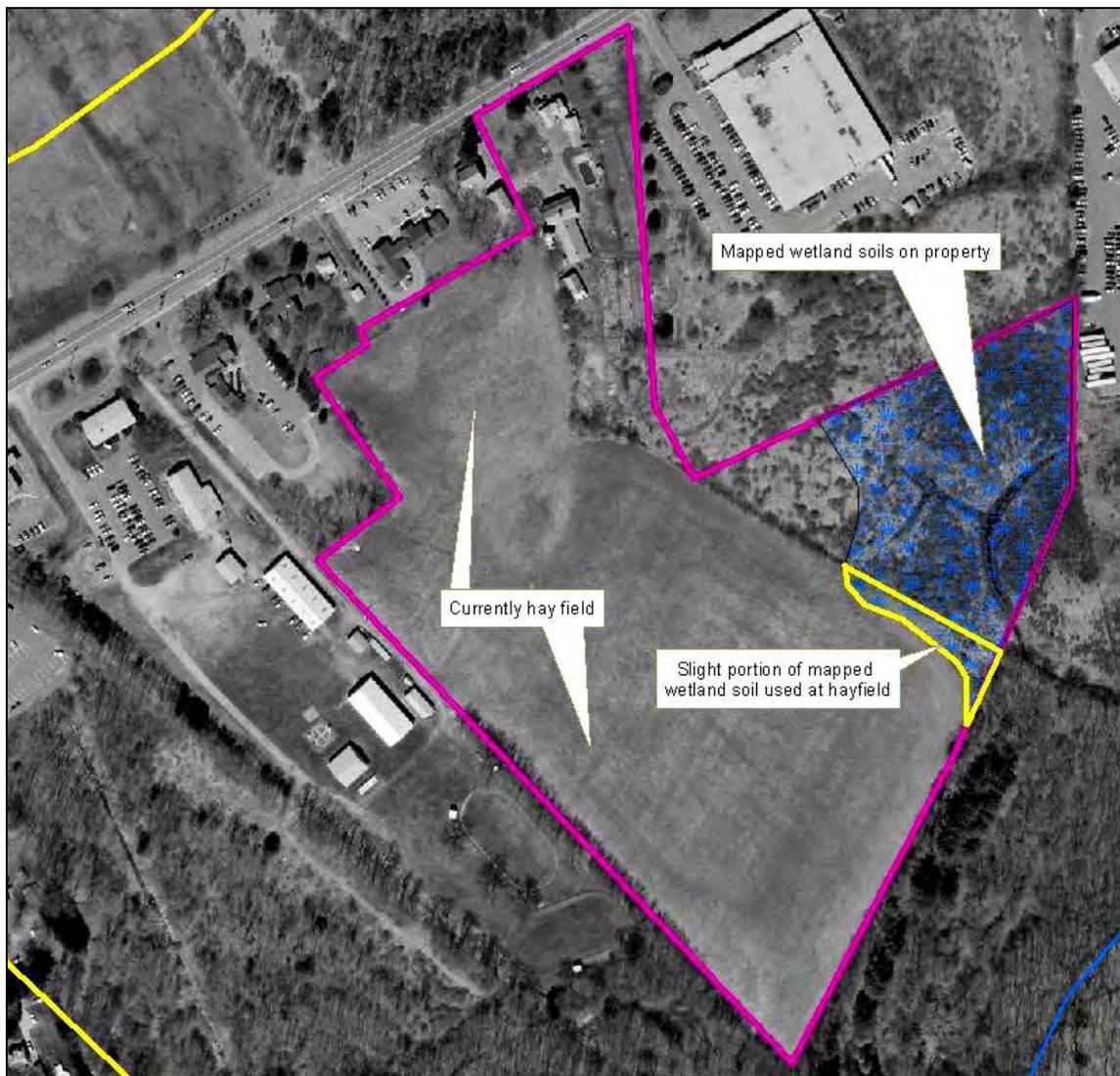
date of the 1934 photograph. It should be clear from this aerial photograph that at that time, hydric/wetland soils were made use of for farming purposes.



This 1934 Aerial Photograph, with a coarse approximation of current Gunther boundaries in white and the town boundary in black, shows the land-use of the property in April 1934. In the southeast portion of the picture the many arteries (in black and dark shades of gray) of Gages Brook can be seen meandering across the landscape. (Source: Connecticut State Library, Connecticut's Aerial Surveys, 1934 Collection, Photo Number: 02305)

In the years after this photograph was taken the watercourse and wetland system was channelized to maximize useable agricultural acreage.

Comparing the above photograph with the one below it is clear that the hydric areas, especially floodplain wetland, have been historically altered. This photo, taken in spring 2004, shows both the location of the mapped wetland soils and the small portion of mapped wetland used for hayfield still today.



Easily detected on the east side in this photograph are the arc and straight lines of the channelization designed to drain wetland /hydric soils currently mapped on the site. (Source: soils information taken from existing U.S. NRCS soil mapping that makes up the soil layer in the DEPs Geographic Information System(GIS); source date: June, 2011.)

Discussion and Recommendation

Based on the comparison of the two aerial photographs this reviewer would strongly urge that the soils on the southern portion of the property be sampled and a much more concise, highly defined hydric soils map be prepared for the acreage. This reviewer believes the new soil map will show an increase in wetland/hydric soil extent over what is depicted in the currently available soils mapping.

One of the desired uses of the property is education. A cost free, revegetation-of-the-hayfield program would allow for the succession of wetland growth through

the three natural successional stages (this would however necessitate a decrease in the overall hayfield acreage available).

The first stage would be the influx of wetland plants at the herbaceous level, followed by the emergence of a wetland/hydric based scrub shrub environment. The scrub shrub environment will serve to shade and allow for the evolution of the deciduous tree growth. The trees will ultimately dominate the mature wetland community, just as they do today in the adjoining floodplain to the south today along Gages Brook.

Typical of this existing forested floodplain is an often heavy ground cover of skunk cabbage (*Symplocarpus foetidus*) and a fairly mature tree canopy dominated by red maple (*Acer rubrum*) which tolerates the annual historic flooding of the brook. White pine (*pinus strobus*) can be found on slight upland islands and along the upland edges of the wetland. The tree canopy also shades the stream thus impacting water temperature. Deadfall found in the stream bed perpendicular to flow often acts as a small damming mechanism which then aerates/oxygenates the water with the creation of miniature waterfalls.

Any reclamation of wetland area would also increase habitat for common inhabitants of the wetland forest including raccoons (*Procyon lotor*) and whitetail deer (*Odocoileus virginianus*).



There is currently an active WHIP (Wildlife Habitat Incentive Program) project on the TAC property. The project will restore features mentioned above. WHIP is a USDA-NRCS program that helps improve fish and wildlife habitat and restore natural ecosystems. For more information please contact Fernando Rincon, USDA NRCS, (860) 688-7725, fernando.rincon@ct.usda.gov.



Fisheries Resources

Gages Brook is a small first-order headwater stream that empties into Walker Reservoir located within the Tankerhoosen River Watershed. Gages Brook is incised as it flows through Tolland Agricultural Center (TAC) property. Incised channels are deep-well defined with very narrow widths often caused by rapid down-cutting into substrates. This condition has resulted in an unstable channel that continues to downcut, erode its streambanks and lose contact with its floodplain. Upper sections of the brook have been channelized (straightened) due to man-made alterations associated with past agriculture practices and development of the Tolland Industrial Park. Increases in impervious surfaces in the watershed have probably caused or exacerbated stream incision and streambank erosion.



The Gages Brook riparian zone shows evidence of past disturbances that have created a somewhat partially open riparian canopy decreasing its ability to shade solar radiation and prevent increases in stream water temperature. In addition, there is extensive growth of the invasive plant multiflora rose that has impacted the composition and

diversity of riparian zone vegetation.



Streambed substrates are comprised of small gravels intermixed with fine to coarse sands. Sands appear to mostly emanate from runoff due to winter roadway deicing activities and some natural materials that have eroded from unstable sections of the streambank. Stream mesohabitats are mainly in the form of alternating riffle, run and small pool sequences. Pools are somewhat shallow and lack adequate instream cover and depth.

A past electrofishing survey (8/31/89) of Gages Brook conducted by DEP Inland Fisheries Division staff have documented that this resource would be defined as a coldwater resource that does support a native brook trout fish population. Refer to physical, chemical, and biological data presented in Table 1. Brook trout, which are species native to Connecticut, typically spawn during the month of October. Eggs incubate within gravel substrates over the fall and winter periods with eggs hatching in late February or early March. Fry remain in the gravel until their yolk sacs are absorbed at which time the fry emerge from underneath the gravel and move into preferred stream microhabitats. Fry emergence occurs when fish reach about 1.5 inches in length.

Realizing the importance of brook trout and their habitats, a unique partnership is now underway between state, federal, and local agencies, academia, as well as non-profit government organizations and private citizens called the Eastern Brook Trout Joint Venture (EBJTV). As part of the National Fish Habitat Initiative, this venture is a geographically focused, locally driven scientifically based effort with goals to protect, restore, and enhance aquatic habitat throughout the eastern range of brook trout. More can be learned about these efforts at <http://www.easternbrooktrout.org/>.

Electrofishing data also indicated that Gages Brook supports other fluvial dependent species that includes blacknose dace and white sucker (Table 1). Also collected were juvenile largemouth bass, pumpkinseed and fathead minnow. These are pond species that temporarily reside in watercourses having been “washed out” from upstream impoundments.

The small pond on the property next to Gages Brook has no fisheries resource value.

Recommendations

1. Given the Gages Brook riparian zone has been degraded due to the extensive growth of mainly multiflora rose, TAC should give serious consideration to the implementation of an aggressive invasive species vegetation removal program to eradicate invasives.

2. Gages Brook and adjacent surrounding wetlands could serve as valuable ecological study area for the general public and local school systems and as such, TAC should consider the development of a formal trail system. 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). The trail should follow a closed loop design. 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. Interpretative signs can



be installed along any newly created trail system to explain the types and values of various brook, wetland and upland habitats along with identifying local flora and fauna.

3. Due to the lack of deep pool habitat and diversity of instream cover for brook trout in Gages Brook, opportunities exist in this stretch of brook to restore and enhance instream fish habitats.

Enhancements are designed to emulate natural stream features and would likely involve adding features such as woody debris, logs, and boulders. Collectively, these features will create instream cover and variations in channel depths, flow patterns and increase the quality and availability of fish and aquatic macroinvertebrate habitats. If TAC is interested in exploring instream habitats enhancements, the team's fisheries biologist is willing to further evaluate such opportunities in Gages Brook.

Table 1. Physical, chemical and biological data collected from Gages Brook, Vernon, upstream of Route 84.

PHYSICAL		CHEMICAL		MEAN	STD
STREAM NAME : GAGES BROOK		SITE #:		1111	
SITE DESCRIPTION: UPSTREAM OF RTE. 84, VERNON		SAMPLE LENGTH :		52.	
SAMPLE DATE:		08/31/89			
AIR TEMP.	:21. (C)	DISSOLVED OXYGEN (mg/l). . .	:	9.83	0.12
WATER TEMP.	:17. (C)	pH	:	7.27	0.06
VELOCITY.	: 0.112 (m/s)	COND (uS/cm3). . .	:	129.3	16.74
DISCHARGE	: 0.02 (m3/s)	ALKALINITY .(mg CaCO3 eq/l):	:	8.83	0.55
WIDTH.	:	MEAN	:	1.96	0.69 (m)
DEPTH.	:	STD	:	8.9	5.9 (cm)
DOMINANT SUBSTRATE TYPE. . .	:	4	:	POOL/RIFLE RATIO . . .	0.401
TYPE THREE SUBSTRATE	:	21.4 (%)	:	AIR/WATER TEMP. RATIO:	1.272
EMBEDDEDNESS OF TYPE THREE :	:	60. (%)	:		
OVERHEAD CANOPY.	:	66. (%)	:		
INSTREAM SHELTER	:	2.00 (m2)	:		
SPECIES		BIOLOGICAL		(NUMBER/HA)	STANDARD ERROR
				POPULATION SIZE	
Salvelinus fontinalis	• Brook trout			12.	0.
Rhinichthys atratulus	• Blacknose dace			134.	0.
Pimephales promelas	• Fathead minnow			3.	0.
Micropterus salmoides	• Largemouth bass			1.	0.
Lepomis gibbosus	• Pumpkinseed			2.	0.
Catostomus commersoni	• White sucker			9.	0.

Wildlife Resources

Background

The Gunther family property consists of 4 parcels, totaling 22.65 acres, and is situated adjacent to the ~35-acre Tolland Agricultural Center property, which includes multiple buildings and horse rings, as well as forested areas and Gages Brook. The Gunther property also houses several buildings and includes hayfields that total ~14.8 acres.

The request for an environmental review came from the Tolland Agricultural Center (TAC) regarding their proposal to purchase the Gunther property. The TAC is seeking information concerning wildlife and habitat and enhancement, and management, with continued agricultural use of the hayfields.

A site walk was conducted on April 21, 2011. The bulk of the Gunther parcels are currently grassland, while the southeastern border with the TAC property is dominated by thick multiflora rose leading into forest and Gages Brook, as well as a farm pond and vernal pool.

Existing Wildlife Habitat

Hayfields

Early successional habitats including fields, shrublands, grasslands, and meadows 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, such as fire and flooding have also contributed to this decline. All of these factors have combined to result in species declines for many grassland species. 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. Hawks and owls including American kestrels, northern harriers, and short-eared owls may forage in these fields for small mammals and insects. Other species that make use of grasslands and meadows include eastern box turtle, milk snake, and bronze copper (butterfly).

Agricultural fields can provide valuable early successional habitat for many species, although the intensive farming practices utilized today have also contributed to the decline of some of our grassland specialists. Bobolinks and eastern meadowlarks, for example, utilize these sites for nesting, brood rearing, and foraging in spring and summer. However, grassland birds typically require a long breeding and nesting season, sometimes extending into late July, if conditions force them to re-nest. Multiple hay cuttings conducted from May to August can prevent grassland-nesting birds from completing their nesting cycle. If, as proposed, the existing hayfields are kept in agricultural use, ideally they should be mowed no sooner than July 15th to allow birds a chance to complete their nesting cycle. This would also give

reptiles such as box turtles, which can be active in these areas from April through October, a chance to forage in the fields.

One management option is to convert the hayfield to native warm-season grasses to benefit those grassland specialists that require contiguous unbroken areas in order to successfully reproduce. Grassland birds require specific minimum acreages for successful breeding; bobolinks require at least 5 acres and eastern meadowlarks require at least 15 acres. Information regarding planting warm season grasslands can be found in the publication *Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: A Guide for the Northeast*, available through the DEP bookstore or online at the CT DEP Wildlife Division's 'publications' webpage.

Another option is to manage the field to benefit wildlife in general, but not specifically grassland-nesting birds by allowing it to convert to meadow habitat, with a mix of grasses and flowers including purple coneflower, black-eyed susan, and New England aster. A more diverse plant community that contains grasses, weeds and flowers is more useful to a wider variety of species, including Eastern bluebird, red-tailed hawk, and smooth green snake. Brush hogging or mowing should occur every year or every couple of years, in order to keep saplings and small trees from growing up. Mowing should be conducted after August and before April in order to allow any nesting species to complete their reproductive cycle.

Forested Field Edge

The immediate field edge is comprised of an impenetrable barrier of invasive multiflora rose and conifers, and the invasives continue east to where deciduous trees dominate the overstory. Dominance by non-native invasive species such as multiflora rose significantly reduces plant diversity by displacing native vegetation. Although invasive vegetation still provides cover and structure, the lack of plant diversity results in lower quality forage and diminishes the value of an area for wildlife. This portion of the property, while technically not part of the Gunther property, should be managed to treat and remove invasive species.

Wetlands

While also technically not on the Gunther property, there are several wetlands found on the TAC property that, if properly managed, can provide additional habitat in conjunction with the Gunther property, further increasing the wildlife value of the property as a whole.

Gages Brook:

Gages Brook runs along the forested southeastern portion of the TAC property. The brook has a shrubby border of mostly invasive multiflora rose, which continues in from the field edge. Healthy vegetated riparian (streamside) borders are important in protecting and enhancing aquatic habitat, as well as providing travel corridors for species such as white tailed deer, and providing habitat for species such as water shrews, some amphibians and many invertebrates. Controlling the invasive species would allow for a more diverse array of native species and enhance the value of the habitat for wildlife.

Old Farm Pond:

In its current condition, this pond has limited wildlife habitat value due to the lack of vegetation. Installing shrubs and tall grasses, or allowing vegetation to grow up by not mowing around the pond would provide cover for reptiles and amphibians, as well as for birds and mammals using the pond as a source of water, and provide habitat for nesting birds.

Vernal Pool:

One potential vernal pool was located during the site walk. Vernal pools are small, temporary bodies of standing fresh water that are typically filled in spring and dry out most years. There is no inlet or outlet, and therefore fish are not found in these pools. Vernal pools are important to the survival of many species of reptiles and amphibians that utilize wetlands for reproduction. For some species, such as the wood frog and the spotted salamander, vernal pools are critical because it is the only type of wetland in which they will breed. These species are also dependent on the presence of healthy forested uplands surrounding the vernal pool, because, when not breeding, this is where they spend the balance of their life cycle. Calhoun and Klemens (2002) recommend that the upland areas around breeding pools up to a distance of 750 feet be considered critical upland habitat, that at least 75% of that zone be kept undisturbed and that a partially closed-canopy stand be maintained. It would be beneficial to conduct a spring survey at the pool to document all breeding species.

Education, Nest boxes, Trails

TAC has expressed an interest in including an educational component to their management. In addition to the existing butterfly garden and interpretive signs, bluebird nest boxes with educational signs should be installed. Boxes should be properly designed and maintained, and inspected regularly. Predator guards on nest box mounting posts are important to prevent predation by raccoons, snakes or domestic cats.

If a recreational trail is to be developed, care must be taken in order to prevent disturbance to wildlife. Please see Attachment A regarding recommended guidelines for trail establishment. Trails should not bisect the grass fields, as this would provide predators with additional easy access to more portions of the field. Because small mammals and ground nesting birds are easily disturbed and sometimes killed by domestic dogs, it is advisable to require that dogs are kept leashed at all times. At a minimum, dogs should be leashed during the entire nesting season.

Summary

The TAC purchase of the adjacent Gunther property provides an opportunity to manage valuable habitat for a variety of wildlife species. The property includes fields that, if managed as warm season grasses, are of sufficient size to provide nesting habitat for some of Connecticut's declining grassland bird species. Alternative management strategies, including developing the field into meadow habitat or modifying the current agricultural regimen also would provide benefits to wildlife. The adjacent areas, including wetlands and forested riparian zone, can be properly managed to provide a mosaic of habitats, benefiting a wide variety of species. The property also offers the

potential for outreach and education regarding wildlife, through the use of properly developed trails and use of interpretive signs. Given proper management and outreach/education, purchase of the Gunther property could be beneficial to both wildlife and public users of the area.

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)

REFERENCES

Calhoun, A.J.K. and M.W. Klemens. 2002. MCA Technical Paper No. 5. Best Development Practices (BDPs): Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States. Metropolitan Conservation Alliance, Wildlife Conservation Society. Bronx, New York. 2002.

Invasive Plant Management

Overall Comments

1. The shrubby, triangle-shaped area east of the Gunther hayfield should be maintained as early-successional shrubland (and not allowed to revert to forest).
2. In regard to invasive plants, it is unrealistic to expect to be able to eradicate them from the property. Priority situations for control:
 - trail sides (where human and animal traffic can most easily pick up seeds)
 - areas being interpreted for the public as ecological landscaping
 - within areas slated for control, the priority shrubs are large ones in the sun or at the forest edge (which produce disproportionately larger numbers of fruits)
3. Viburnum Leaf Beetle (VLB) damage was recently observed in Zone 6. VLB is newly introduced to Connecticut and seems to eat only Viburnum foliage. The larvae pupate in the ground. In wildland situations, there is no reasonable treatment currently available. Additional plantings of Viburnum species are not recommended.

Recommendations and Comments on 7 Management Zones:



Zone 1: Vicinity of the Gunther house and buildings

- Large Norway Maples – leave as shade trees

Zone 2: Gunther Hayfield

- There is a large Autumn-olive in the dry, steep area near the top of the field. It is a potential seed source, but it also is educational in that it shows what a mature Autumn-olive looks like and it shows how Autumn-olive root's ability to fix nitrogen makes it grow well on poor sites.
- the field is infested with Bedstraw (*Galium* sp.) which is not listed in Connecticut as invasive, but is well known as an agricultural weed. Better quality hay would be produced if something were done about the Bedstraw. If nothing is done, it will likely become more and more pervasive in the field.



Zone 3: Triangle-shaped former livestock holding pen (easternmost portion of Gunther property)

- Although this area has many species of invasive plants present, it also provides shrubby wildlife habitat (an increasingly uncommon type of habitat in Connecticut)
 - The southernmost portion of the area is dominated by native species including Arrowwood Viburnum, Alders, and Dogwoods (possibly planted along the wet area??). These thickets are difficult for people to pass through and represent good wildlife habitat for birds and mammals.
 - Moving northward and out of the wetter soil, invasive plants such as Multiflora Rose (most common), non-native shrubby Honeysuckles, Asiatic Bittersweet vines, Winged Euonymus, and Garlic Mustard are encountered in addition to Crabapples (not native to Connecticut, but not listed as invasive) and Black Cherry and Hickory (native CT species).
 - The Multiflora Rose is well-developed making passage through the area hard for people.
 - Multiflora Rose cover is better than no shrubby cover at all.



- At some point it would be worth mowing the area (with a Forestry mower) to encourage the shrubs to re-sprout with dense new growth – promotes flowering and to prevent young trees from growing up to dominate the site.
 - Because of the presence of Garlic Mustard, any mowing equipment should be cleaned following its use in the area
 - To preserve continued availability of shrubby cover, the entire area should not be mowed at once
 - Fruit and nut trees have wildlife value, but if allowed to mature in numbers, they will shade out the shrubby habitat.
 - Individual trees could be felled. (Note that down logs provide wildlife habitat.)
- The area should be monitored for defoliation by Viburnum Leaf Beetle.
 - If there is extensive mortality, shrub planting would be desirable.
 - The presence of deer browsing does not bode well for the success of planting native plants in this area unless the plants are protected.

Zone 4: Streamside (owned by TAC)

- Invasive plants are present, but this is generally not a high priority area for invasive plant management.
 - Because its seeds are moved by flowing water, Garlic Mustard would be the most important species to address (pull and bag)
 - Erosion on the streamside appears to be a problem (which I do not address here).
- If plantings are done in the streamside area, fast-growing, relatively deer resistant plants are recommended.



Zone 5: Butterfly Garden/Pond Area and recently improved woods road

- Currently this area is under a WHIP contract for removal of invasive species.
 - Recommend continued follow-up following the expiration of the contract
 - Autumn-olive, shrubby Honeysuckles, Multiflora Rose, and Japanese Barberry
 - Garlic Mustard was not observed, but it should be watched for and addressed immediately by pulling and bagging (flowering plants pulled and left are capable of producing seed pods with viable seed)



Zone 6: Woods beyond the pond area

- This area is comparatively free of invasive plants.
- Volunteers might be asked to do:
 - Monitoring for, and removal of, Garlic Mustard
 - Removal of scattered invasive shrubs (Japanese Barberry, Multiflora Rose) with a weed wrench
- Continuation of the native plant labeling project is recommended



Zone 7: Fence Rows

- Despite the presence of many invasive species, the fence rows that border the TAC grassy area and the Gunther hayfield should be retained for their wildlife value
 - If it were of particular interest to someone, individual fence row invasives could be removed where they are crowding native shrubs
 - a section of the fence row could be selected as an invasive species educational site and the plants labeled.

Archaeological and Historical Review

The Office of State Archaeology (OSA) notes that the proposed project area possesses a moderate-to-high sensitivity for archaeological resources. Areas of sensitivity include well-drained soils, generally level topography adjacent to the wetland basin for pre-Contact Native American camps. The proposed plans for the Gunther property by the TAC include hiking trails, nature areas, the Sheep and Wool Festival and Boy Scout Jamboree will not have any effect on below ground cultural resources. In addition, tilling of the soil for agricultural purposes will not likely to effect cultural resources due to past agricultural activities on the property. So, the OSA suggests that while there is a moderate to high sensitivity for pre-Contact native American sites, the proposed land use activities will not have any adverse effect on cultural resources that may exist on the property.

Educational opportunities highlighting Native American lifeways and horticultural activities may exist for the TAC with the tilling of portions of the farm. This would provide a survey opportunity for archaeologists to surface survey the fields after the soil has been turned over by the plowing activities. This pedestrian survey can locate areas of potential archaeological sites below the plow zone and provide a field workshop for students and the public to learn about the cultural past and the science of archaeology.

The Gunther property has a most interesting history especially in light of changes in modern agriculture and the farm's ability to adapt to these industrial conditions. The existing structures, including the house and barn, appear to be eligible for the State Register of Historic Places. The barn has many early 20th-century architectural features that remain intact and appear to have integrity. The house appears to be built around the turn of the 20th-century and it also contains architectural elements that appear to have integrity for some of its earliest features.

Considerations to listing the structures on the State Register of Historic Places may provide funding opportunities for restoration projects associated with maintaining the barn.



The site of what was thought to be a sawmill location reported by Fred Babbitt was incorrectly reputed to be behind the Gunther property on Gages Brook upstream of the TAC pond (where there is a long berm between the Gunther field and the brook). The reported site is actually on Loehr Brook which feeds into Gages Brook downstream of the TAC pond and upstream of I-84. It was shown by Fred Babbitt to Charlotte Pyle, Fernando Rincon of USDA-NRCS and Nick Bellantoni (state archaeologist) on March 26, 2012. At this site, a low berm perpendicular to the stream is now breached by Loehr Brook. Downstream right of the small berm is a rectangular hole in the ground which Mr. Babbitt said resembles a hole that he saw elsewhere that was associated with the place where a portable steam engine once ran a small sawmill. (Connecting sawmills to portable steam-engines was a widely-used technique all over the country prior to gasoline-driven motors and enabled small commercial operators to mill a lot of wood. Water was required in the operation of the steam engines. For a brief description and pictures of the lumbering industry in Connecticut in the 1920's please see the Colebrook Historical Society web site -

<http://www.colebrookhistoricalsociety.org/Lumbering1920s.htm>)

In a cursory examination by Nick Bellantoni, no further evidence or suggestion of a sawmill operation was observed on the ground's surface.

The Office of State Archaeology is available to provide technical assistance to TAC in pursuing any of these recommendations. Should you have any questions regarding this review, do not hesitate to contact them at the university.

The Shenipsit Trail

The Blue-Blazed hiking trail system is managed by the Connecticut Forest and Park Association and currently totals over 825 miles of hiking trails in 88 Connecticut towns. The 41 mile Shenipsit Trail is located in Central Connecticut starting in Cobalt, Ct and ending in Somers, CT. The central portion of the Shenipsit Trail goes through Vernon, CT and a portion of the trail has been re-located onto the TAC Property from state and local roads to close an approximate four 4 mile gap.

The Gunther Property would offer another opportunity to continue the trail across a property with environmental, historical and agricultural features. There would also be a stunning view from the high point across the farm fields to the wetlands and streamcourse.

Steve Wood, in his CT Museum Quest blog, writes a detailed description of the Shenipsit Trail and includes the re-routing through the TAC property. To read his descriptive blog with photos use the links below.

http://www.ctmuseumquest.com/?page_id=9389

http://www.ctmuseumquest.com/?page_id=10180



Renewable Energy Possibilities

Solar Power - Photovoltaic

For the foreseeable future, solar photovoltaic (PV) systems will be most attractive economically when used to provide energy for on-site (“behind the meter”) applications. Consequently, it is recommended to install PV on the south-facing roof of the office building, sized to serve the average annual electric consumption of that facility. As a rough estimate, you can divide the annual total kilowatt-hours used by the building by 1100, to determine the appropriate size of the PV installation in kilowatts DC. The cost of the system will be about \$5000 - \$5500 per kW, installed.

In 2012 and beyond, non-residential solar PV systems will be incented by the “Z-REC” program now under development. Under that program, qualifying non-residential PV systems will generate one Zero-emission Renewable Energy Credit (Z-REC) for every 1,000 kWh of energy produced. The Z-RECs produced can be sold to Connecticut’s energy suppliers in a bidding market to be managed by the utilities. The rules of the program are expected to be announced spring 2012:

[\(http://www.cl-p.com/Home/SaveEnergy/GoingGreen/Renewable_Energy_Credits/\)](http://www.cl-p.com/Home/SaveEnergy/GoingGreen/Renewable_Energy_Credits/)

For small PV systems (<10 kW) the Z-REC program may not be very attractive until and unless organizations emerge that can aggregate the Z-RECs produced by small suppliers, because metering and administrative costs can be costly. It may make sense to explore options, such as the third-party ownership or leasing programs that are now offered in some states, and may be in Connecticut in the near future.

Solar Power - Thermal

From the conversation this reviewer had at the time of the review, there did not appear to be a significant year-round need for domestic hot water at the site, so it is unlikely that a solar thermal system would be cost-effective. If the use of the outbuildings (or the office building) changes to functions requiring significant (year-round need for >40 gallons/day) use of hot water, it is recommended to solicit proposals for the installation of a solar thermal system. Size would depend upon expected consumption, but for any reasonable water usage, there should be plenty of roof space.

Wind Power

The open fields of the property and the location in northeast Connecticut may be suitable for a wind turbine installation. However, there is not enough electric demand on-site to justify the expense of a wind turbine. For turbines of less than 100 kW in capacity, the cost per kW rises significantly as the capacity drops. Consequently, these smaller turbines are generally viable only in areas with very strong winds, which would not be the case on the Gunther property. A commercial-scale wind turbine (e.g., megawatt class) might be economically viable for generating power for sale to CL&P (wholesale market), but it would have to be mounted on a tall tower (e.g., about 250 feet) and would

be very visible to the surrounding community. Based on previous experience, it is highly likely that there would be some objections to such a project on the basis of visual impact, noise or light “flicker.”

Ground Source Heat Pump

If use of the on-site buildings changes to require year-round heating and air-conditioning, is recommended to investigate a ground-source heat pump system. The open fields could make installation of the ground loop fairly economical by enabling a trenched “slinky” ground loop instead of the drilled wells required in most Connecticut locations.

However, because these systems have a high up-front capital cost, it may make sense to hold off on this type of system, even if you could use it now, until CEFIA’s (Clean Energy Finance and Investment Authority) programs are developed and introduced.

<http://www.ctcleanenergy.com>

Other Technologies

There did not appear to be any other renewable energy resources available at the site. The stream running through the property does not have a high enough head or flow to be developable, and it is likely that the stream’s scenic value is far greater than its energy potential. The property is not large enough to grow biomass for either biofuels or gasification economically.

Appendix

History of the Gunther Property
TAC Documents
Viburnum Leaf Beetle
Norway Maple

The first barn (circa 1892) was built on the same spot as the present one. The cows were housed on the lowest level. The hay barn above. Most of this information is hearsay but I got most of it from my mother-in-law.

On July 7, 1900 Frederick Gunther and his son Charles were milking when a severe thunderstorm broke out. Charles was scared (he was about 12 years old) and told his father he was going to the house and would come back to finish the milking (by hand) later. He was at the door when the lightning bolt struck. He called to his father several times but never heard a response from him. By this time the burning hay was falling into the milking area. The first cutting of hay was finished a few days earlier. Edith told me that all they found of Frederick was under the cow he was milking. Since the stanchions were partly melted, he most likely was electrocuted and never knew what hit him.

When the Northeast School on East Street was built in the early 50's, they discovered this area sat atop an underground lake. When we drilled our artesian well (under orders from the St. of Ct) in the 1950's, it took the drillers the first half of the day bailing out the quicksand. They didn't hit ledge until after the 200 ft mark. These facts probably explain why two barns were struck by lightning and destroyed by the fires.

The second barn across the driveway to the left of the present barn (circa 1920 or 1922). Charles was running the farm for his mother. She (Mary) moved to 153 Grove Street St. about a month after Charles and Edith were married in April 1918. Dorothy has lived in that house since 1952 or 1953.

When the second barn was destroyed by fire after a lightning strike, Mary Gunther went out of the dairy business. But she did give Charles and Edith a mortgage to get them started.

Barn #3 was built on the site of Barn #1. Russell and I were married November 22, 1951. On our honeymoon we drove to St. Petersburg Florida to visit with Aunt Rose. We got home on December 5, 1951. Between that date and November 1951 Charles estate was settled. (He died Feb. 1950). The farm and other assets were distributed on Jan. 1, 1952. Russell's share was the farm plus cattle and machinery and farm house.

On December 18, 1951 (one week before Christmas) about 4 p.m. we were hit with a microburst (almost a tornado). All the cattle were in the barn. The entire roof of that area was blown off and the roof of the silo and cupola on hay barn. One end of the hay barn was blown in down to the plate. The fact that the hay barn was quite full saved losing the whole hay barn. The cattle had to be moved that night and your father (Frank Niederwerfer) helped us find a place to move to and helped to transport the cattle. Our marriage got off to a great start! The cattle didn't return until mid June 1952.

In 1952 we rebuilt the cow shed in the same area but made it 25 ft. longer. We turned the cows around as we put in an automatic manure remover.

We went out of business in 1962. Cumberland Farms set up retail stores and took our business away. After World War II all the returning G.I.'s bought cars and ruined the small milk delivery service.. It's hard to believe that there were 17 small dairy farms serving the city of Rockville and environs. As you well know, you had to be big or bigger to survive.

The cow barn was converted into a horse barn with box stalls. We had the business until Russell died in April 1983.

P.S. When we restored the barn in 1952, we made sure lightning rods were installed on the barn and house. One week after the cows came back to the farm we had a ding-dong thunderstorm and one of our customers on East Street saw a lightning bolt bounce off the lightning rod points on top of the hay barn. So we almost lost barn #3 to the same fate as the first two barns.



Tolland County Agricultural Center, Inc.

24 Hyde Avenue (Route 30) Vernon, CT 06066

860-875-5714

www.tollandcountyagriculturalcenter.org

Mission Statement:

Provide an environment where agricultural production education, ecological landscape education and leadership education is available for all ages and all citizens of the state of Connecticut.

*TAC ... Supporting All Branches of Connecticut Agricultural Education
And Family Life Programs since 1956*

History of Tolland County Agricultural Center:



In 1955 leaders of the Tolland County Farm Bureau, which then sponsored the Tolland County Extension service, realized the need for a permanent home for the Extension Service. The previous office for the Extension Service was destroyed when the building caught fire in downtown Rockville. It was decided by the Farm Bureau that property would be selected to create the Tolland County Agricultural Center. Several sites were looked at when deciding the future

location of the Tolland County Agricultural Center. Through the generosity of the Town of Vernon, a portion of the former Town Farm property, became available for purchase for the sum of \$10,000. Local farmers joined together and voted in favor of purchasing the property.

In 1956 the Tolland County Agricultural Center was incorporated by county leaders in 4-H, homemaking and agricultural programs. It was envisioned that the center would provide space for the 6,000 individuals who were actively involved in programs such as 4-H, Boy Scouts of America, Girl Scouts of America, etc. The center was established as a non-profit, self-supporting organization which would be owned by the individuals who contributed \$25 or more towards the development of the center.



With the need for funding becoming necessary, the Tolland County Agricultural Center Board of Trustees developed a fund-raising project. The project reached out to local community members as well as legislative members asking for cash donations, pledges, and offering auctions. Local legislators appropriated \$11,120 towards this civic project.



Once funding was available, Tolland County Agricultural Center began to grow. During the summer of 1959 an activities building was constructed with the help of a local carpenter and the assistance of volunteer labor. Shortly after, a horse show ring was developed, water lines were installed and a parking lot was created with the assistance of local farmers who contributed their equipment towards the

development. Once an established grounds had been created the Tolland County Annual 4-H Fair permanently moved to the Tolland County Agricultural Centers grounds where it has remained to this day.

During 1960 the Tolland County Agricultural Center continued to expand. The Board of Trustees began planning out the construction of the Main Office Building which was planned to house the County Extension Service, Agricultural Stabilization & Conservation Service, Soil Conservation Service and the Selective Service. Also in this building, meeting rooms were constructed so that members of various agricultural, homemaking & youth development programs could meet in the facility. The building also contained a demonstration kitchen for both adult and youth homemaking groups.

In the early 1960's the Tolland County Agricultural Center was hailed as one of the most outstanding civic projects ever planned by the people of Tolland County. As one reporter noted - 'This forward-looking program will be of immeasurable value to the people of Tolland County in the years to come. These facilities will help improve the program for the development of our youth and teaching of new skills for the enrichment of our homes. Maintaining a prosperous agriculture, with a gross of nine million dollars a year is important not only to the economy of our farm people but to our business people as well.



Over fifty years have come and gone since this project was merely a vision of agricultural and homemaking leaders in Tolland County. Six more structures have been added to the property to make it more beneficial to the many groups which now hold their programs on the TAC grounds. The offices are currently rented by the North Central Conversation District (NCCD), the Connecticut Cooperative Extension System (which includes the 4-H youth education program), the Integrated Pesticides Management program, the Master Gardeners and SARE Program. Current projects on the grounds include the many gardens, a labyrinth that blooms in the spring, grass demonstration plots and the nature area and trails. The grounds and meeting spaces are used for such events as the Sheep and Wool Festival, the Tolland County 4-H Fair, dog shows, Environthons, Boy Scout Jamborees, the UConn Parenting Programs and a variety of 4-H meetings.



Founded in 1875
Putting science to work for society

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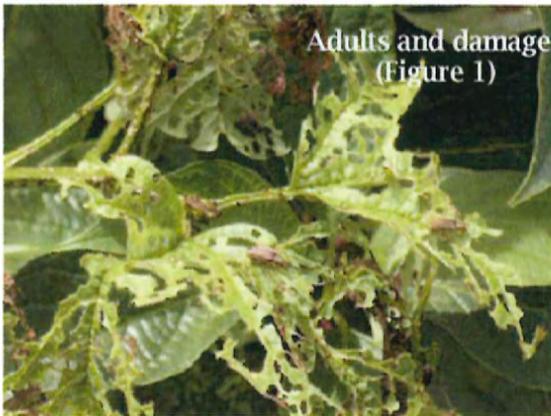
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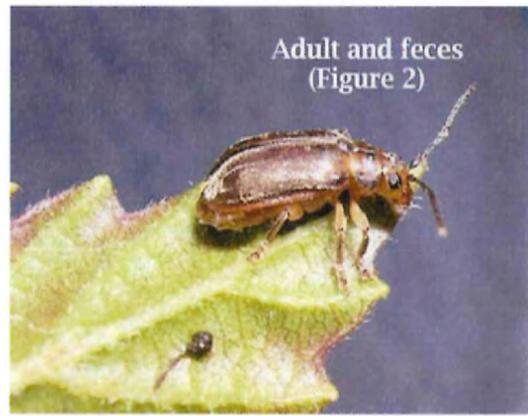
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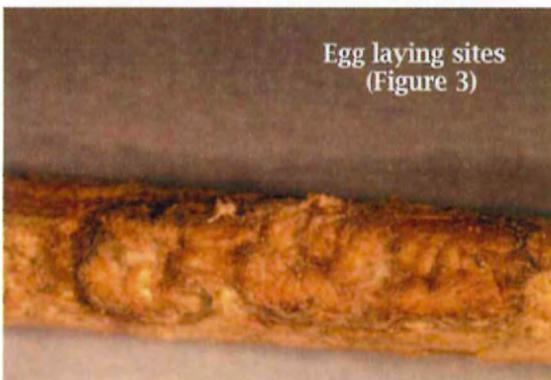
VIBURNUM LEAF BEETLE, *Pyrrhalta viburni*, (COLEOPTERA: CHRYSOMELIDAE)



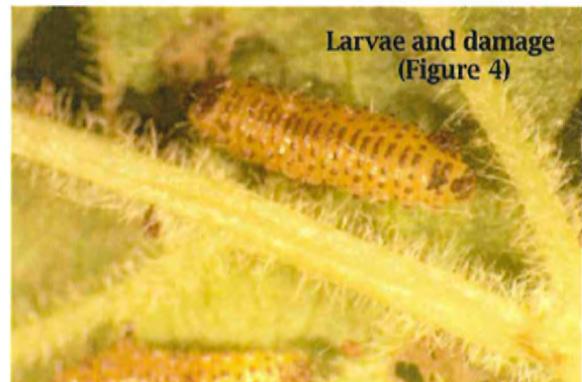
Adults and damage
(Figure 1)



Adult and feces
(Figure 2)



Egg laying sites
(Figure 3)



Larvae and damage
(Figure 4)

Images by Timothy Abbey, Richard Cowles and Rose Hiskes

The viburnum leaf beetle was first found in Connecticut in 2004. Yellow to brown adults are approximately 1/4" long and feed on foliage of thin-leaved viburnums from July to September (Figures 1, 2). During the summer and fall, mature females make

straight rows of cavities on the undersides of terminal twigs. They lay multiple eggs in the cavities and cover them with a mixture of feces and shredded bark (Figure 3). Flattened brown-spotted yellowish larvae hatch mid-May the following year and feed

on the emerging leaves (Figure 4). As a group, they skeletonize leaves beginning on the undersides, but as larvae, they increase in size. Then, they begin to eat through the entire leaf, leaving only the veins.

Approximately a month later, they crawl to the ground to pupate in the top 1 – 2 inches of soil. Adults emerge in three to four weeks (July), feed, mate and begin laying eggs in the twigs. Initial feeding by adults results in oval holes in leaves that can progress to total defoliation. There is one generation each year.

When noticed, larvae and adults can be handpicked. Twigs with eggs can be pruned off during the winter months when they are most visible. Azadirachtin, which is among the compounds registered for use against this pest in Connecticut, will control small larvae and repel adults. Bifenthrin, permethrin, and rotenone can also be used. Multiple applications are often necessary. Imidacloprid applied as a systemic to be taken up by the roots may provide season-long control. Consult the label for dosage rates and safety precautions.

Probably the most important control measure for viburnum leaf beetle will be to plant species that are resistant to feeding by this pest. While at Cornell University, Dr. Paul Weston rated viburnums for tolerance to viburnum leaf beetle (www.hort.cornell.edu/vlb/index.html). Highly susceptible and susceptible species will die following approximately three successive years of defoliation.

Highly susceptible

- V. dentatum*, Arrowwood viburnum
- V. nudum*, Smooth Witherod
- V. opulus*, European cranberrybush viburnum
- V. opulus* var. *americana* (formerly *V. trilobum*), American cranberrybush viburnum
- V. rafinesquianum*, Rafinesque viburnum

Susceptible

- V. acerifolium*, Mapleleaf viburnum
- V. lantana*, Wayfaringtree viburnum
- V. rufidulum*, Rusty blackhaw viburnum
- V. sargentii*, Sargent viburnum
- V. wrightii*, Wright viburnum

Moderately susceptible

- V. alnifolium* (syn. *V. lantanoides*)
Hobblebush
- V. x burkwoodii*, Burkwood viburnum
- V. cassinoides*, Witherod viburnum
- V. x carlcephalum*, Carlcephalum viburnum
- V. dilatatum*, Linden viburnum
- V. farreri* ('*Nanum*' is highly susceptible)
Fragrant viburnum
- V. lentago*, Nannyberry viburnum
- V. macrocephalum*, Chinese snowball viburnum
- V. x pragense*, Prague viburnum
- V. prunifolium*, Blackhaw viburnum
- V. rhytidophylloides*, Lantanaphyllum viburnum

Resistant

- V. bodnantense*
- V. carlesi*, Koreanspice viburnum
- V. x juddii*, Judd viburnum
- V. plicatum*, Japanese snowball viburnum
- V. plicatum* f. *tomentosum*, Doublefile viburnum
- V. rhytidophyllum*, Leatherleaf viburnum
- V. setigerum*, Tea viburnum
- V. sieboldi*, Siebold viburnum

Norway Maple *Acer platanoides*

Much of the background for this article is taken from a 1990 article on the “History and Range of Norway Maple” by David Nowak and Rowan Rowntree (*Journal of Arboriculture* 16:291-296) and from Michael Dirr’s *Manual of Woody Landscape Plants*, 5th edition, revised 1998.

From Whence it Came: As is perhaps no surprise, Norway maple is native to Norway. In fact, it is native to Norway, the whole Scandinavian peninsula, Belarus, Russia and central Europe, on into the northern part of Iran. Although it is geographically the most widespread native maple in Europe, in terms of numbers, it is not. That honor belongs to *Acer campestre*, the hedge maple. Also, the Norway maple is not native to the British Isles or to the coastal areas of Western Europe.

In its native habitat, Norway maple tends to be found scattered in small groups, mixed in stands with other hardwoods. The Norway maple does best in mesic, lowland sites with a good supply of water, such as at the base of slopes, although it will tolerate a range of conditions. Generally, it is considered to be shade tolerant when young, but only intermediate in shade tolerance when older. It matures into a moderately tall forest tree, some 60-90 feet in height (although the North American champion found in New Paltz, NY, stands 137 feet tall!).

The Norway maple is considered of minor value as a timber species – again losing out to its more populous cousin, the hedge maple, which is often sold as European maple. It is occasionally stated in the literature that the backs of Stradivarius violins are made from Norway maple, although there are no reports of any such violins being disassembled to test this claim.

Why it Got Here: It is likely that the first Norway maples came to North America around 1756. That is about when the species was first listed in the seed catalogues, and also when there is a record of the first planting (in Philadelphia). The original geographic source of these early trees is not known, and perhaps was not known to the first buyers and sellers, since much of this early stock came from English botanical gardens, where the tree is not native either. Regardless, early on Norway maple became established in North America and won the support of some early horticulturalists, although its real popularity did not begin until sometime around 1870.

There is a solid list of fans of the Norway maple from the 1800’s. After all, what is not to like? It is a moderately large, well-formed maple, often with good summer and fall color, that establishes well, grows quickly, is relatively resistant to serious insect and disease problems when healthy, and can tolerate a variety of sites. It is somewhat geographically restricted - it does do best in the eastern and north-central parts of the country, and does less well in the far south and western US.

Because of the perceived potential of this tree, plant growers have been prodigious in developing Norway maple cultivars. In addition to the species, cultivars include the Crimson King, Emerald Queen, Schwedler and Parkway. In their 1990 article, Nowak and Rowntree reference 89 cultivars, while Durr's *Manual* lists in 36 his 5th edition.

Norway maple's popularity as a street tree, however, appears to be a 20th century phenomenon. While it is often stated that supply will meet demand, sometimes the ability to provide supply is what leads to a demand. That seems to be what happened with Norway maple. In the wake of Dutch elm disease, which first began to show up in North America in the 1930's, city foresters and public work directors actively sought replacement species for that pre-eminent street tree, the American elm. Norway maple was already available. Once municipalities gave the tree a try, they found that its ease of production in the nursery, fast growth and tolerance of urban conditions made it a logical choice for city streets, particularly in the eastern and northern central US, where Dutch elm disease first hit. This, in turn, fueled increase interest by nursery growers, who responded with increased production to satisfy the growing demand.

Why Norway Maple is a Problem: Urban foresters today can cite a host of reasons why the Norway maple is not the preferred street tree it was originally thought to be. It has been overplanted, is prone to root problems (especially girdling roots), can scald when overpruned, is subject to a range of insect and disease problems, including aphids, tar spot and verticillium wilt, and tends to hold deadwood – the list could go on. However, the most serious objections have been raised relative to Norway maple's impact on native woodlands.

Norway maple is not an aggressive invader on the order of, say, garlic mustard or Japanese barberry; most exotic tree species are not. However, it does produce a prolific amount of seed that allows it germinate widely – urbanites know the species as a common weed of vacant lots, in hedges and along fence lines. Similarly, the presence of a local seed source will allow the tree to take advantage of disturbed woodlands where, once established, individual trees hold their own and then provide additional seed source for future establishments. As Norway maple seedlings are shade tolerant, they can persist in sites that would normally limit other woody species, including in edge settings and under existing forest canopy.

That alone might not make the Norway maple a problem. However, Norway maple as it grows, tends to steer the situation to its own advantage. The maturing tree casts a deep shade that hinders most vegetative growth beneath its canopy, and may also produce chemicals that further limit the ability of other plants to grow beneath it. It is that feature raises particular concern about this tree's impact on native forest systems. Norway maple trees do not simply just displace native tree species; they also significantly alter the vegetative dynamics of the forest, diminishing understory plants of all sorts. Often, the space beneath the canopy of Norway maples is dark, open and empty – devoid of any significant shrub or herb layer.

This, in turn, may lead to further problems. It has been suggested that pure stands of Norway maple can cause water quality issues, due to the bare soil beneath the stand and

the subsequent increased potential for erosion. The impact on wildlife is also very clear, and of great concern. (To see a good article describing Norway maple problems in a Boston woodlands, you may visit this Earthworks web site: www.earthworksboston.org/articles/UWnorway.htm).

What to Do about Norway Maple: The removal of Norway maples in any systematic way is not likely to be viewed as a practical solution anytime soon. There are an enormous number of Norway maple trees that already exist in the landscape. The Norway maple is, in its various forms, one of our most common street trees and is also a very popular yard tree. Any suggestion for wholesale removal of these trees from the planted landscape is likely to be greeted with a lack of support, if not outright hostility.

It is the popularity of the tree, particular of its cultivars, that makes dealing with them so difficult. Despite regular articles detailing the invasive tendency of this tree and the problem that this causes, people still want to plant new Norway maples, especially such popular cultivars as Crimson King and Schwedler. Nurseries are caught in the middle, not wanting to lose customers or invest in stock that will turn into a liability.

So – saying “don’t plant Norway maples” might have some positive impacts, but only in a limited manner. Legal restrictions on the availability of Norway maple stock may reduce supply and so decrease demand, but only if such restrictions are uniform and extensive – and, even then, their affect will only be over the very long term.

So – what to do? Removing Norway maples whenever possible from natural areas will help, as will encouraging forest management and open space practices that discourage the establishment of Norway maple seedlings. That is probably easier said than done. Foresters, however, tend to be very aware of invasive species, especially invasive tree species, and will be pro-active in implementing measures to reduce their presence as better techniques are discovered.

Also, while restricting nursery supplies might help, a better solution for the landscape use of Norway maple might come through increased understanding of the reproductive abilities of individual varieties and the promotion of those varieties that are not as prolific or, better, not capable of reproduction at all. Ideally, sterile varieties of popular cultivars would allow homeowners to keep these varieties without contaminating the woodlands.

Finally, it is possible that a biological control could arise. Along these lines, it is interesting to note that stressed Norway maple street trees are one of the primary targets of Asian longhorned beetle infestations in New York and, until recently, Chicago. However, as this beetle also attacks native maples and a variety of other desirable trees, it is not viewed by anyone as good control for Norway maples in any context.

Chris Donnelly
Urban Forestry Coordinator
CT DEP Forestry
Hartford, CT

Norway Maple – Identification

An excellent summary of Norway maple characteristics can be found on the UConn Plant Selector web site -

<http://www.hort.uconn.edu/Plants/a/acepla/acepla1.html>

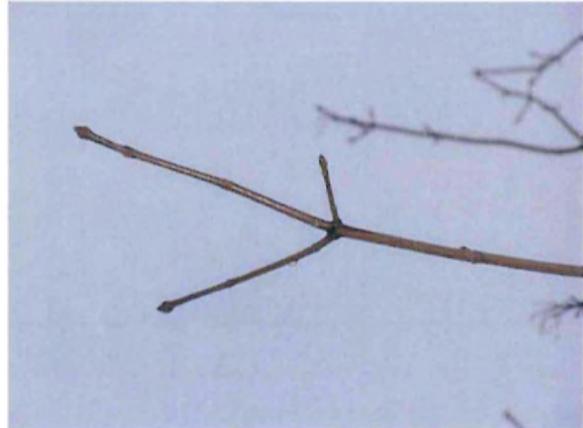


Norway maple is a very popular shade tree, commonly used along streets, in yards and on campuses of all sorts.

(This photo and all photos, unless otherwise noted, are used courtesy of the University of Connecticut)

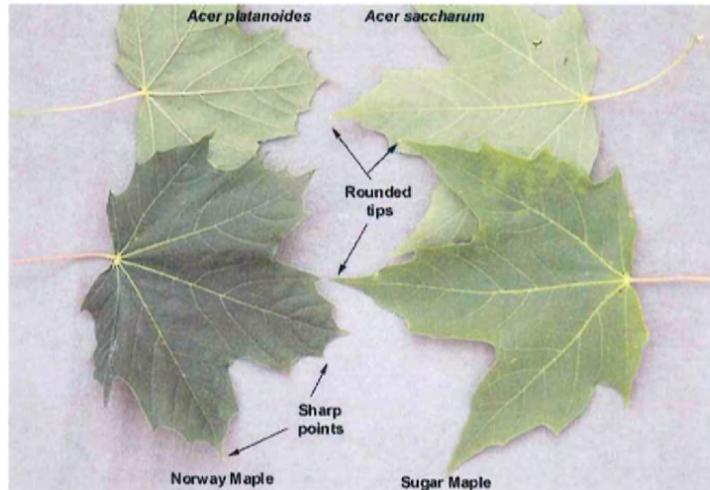
Like all maples, the twigs, buds and leaves of Norway maple are opposite each other on the tree. The buds of the Norway maple tend to be brownish and larger than those of most other maples, native and introduced (the exception is the sycamore maple, which has larger, green terminal buds.)

(Photo courtesy of Chris Donnelly)



The leaves of the Norway maple are very similar to those of the sugar maple, and many people have difficulty telling them apart. On close examination, you might note that the Norway maple leaf is slightly more pointed than that of the sugar maple.

The best test, though, is the sap – Norway maple has a milky white sap, while that of all other maples you are apt to encounter is clear. That is the best test of a Norway maple. (One exception is the mono maple, which is occasionally planted in CT.) (Illustration used courtesy of Oregon State University).



The bark of the mature Norway maple has a very regularly ridged pattern highly reminiscent of white ash. (Photo used courtesy of Yale University School of Forestry and Environmental Studies.)

On younger trees, pattern is more diamond shaped, before the ridged pattern develops. (Photo used courtesy of Chris Donnelly.)



The fall color of Norway maple can be quite attractive and is one of the appealing features of this tree to many who know this tree. Norway maples also tend to hold their leaves longer in the fall than many of the native trees.



Norway maple is also one of the trees that flowers early in the spring, with characteristic green flowers in April. Norway maples are dioecious, meaning that male and female flowers are borne on separate trees.

The fruits of the Norway maple are two-winged samaras, which disperse widely as they helicopter down from trees and then move through flowing water. Reproduction sites often include within hedges and near foundations, as well as in disturbed soils in woodlands.



Another characteristic of Norway maple is very noticeable tendency for its leaves and samaras to be afflicted tar spot – a common and relatively benign foliar disease. In years when moisture is high, by late summer virtually all Norway maples will show some degree of tar spot on their leaves. (Photo used courtesy of Cornell University.)

There are many, many varieties of Norway maple – including the highly popular of which is the 'Crimson King'. To many people, this is the red maple they mean when they use that term.



Other varieties have been chosen for interesting color characteristics, including deep green and variegated forms.



The heavy shade cast by a Norway maple is both one of its greatest strengths when used in a landscape situation and one of its most objectionable characteristics when it escapes into the woods. Its heavy shade allows it to inhibit the growth of other, more desirable species, and, due to a tendency to invade woodlands, has led the Norway maple to be an unwelcome choice for many planting applications. (Photo used courtesy of Iowa State University.)

About the Team

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

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

Purpose of the Team

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

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

Requesting a Review

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

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438, website: www.ctert.org, e-mail: connecticutert@aol.com.

About the Eastern Connecticut RC&D Area

Resource Conservation and Development (RC&D) is a program of the United States Department of Agriculture (USDA). The Secretary of Agriculture gave the Natural Resources Conservation Service (NRCS) [formerly the Soil Conservation Service] responsibility for administering the program. RC&D is unique because it is led by local volunteer councils that help people care for and protect their natural resources in a way that improves the local economy, environment, and living standards. RC&D is a way for people to work together to plan and carry out activities that will make their area a better place in which to live.

Interest in creating the Eastern Connecticut RC&D Area first started in 1965. An application for assistance was prepared and submitted in June 1967 to the Secretary of Agriculture for planning authorization. This authorization was received in August 1968. In 1983, an application by the Eastern Connecticut RC&D's Executive Council was approved by USDA and NRCS to enlarge the area to an 86 town region.

The focus of the Eastern Connecticut RC&D Program is to help people care for and protect their natural resources, improve local economies, and sustain a high quality of life. The program derives its success from its ability to connect individuals, communities, government entities, and grassroots organizations. These connections and partnerships enable the development of shared visions and resource networks that work toward a healthy future for Connecticut. Current members on the RC&D Council represent the Working Lands Alliance, the Essex Land Trust, The Last Green Valley, the Green Valley Institute, the Thames River Basin Partnership, WINCOG, SECCOG, NECCOG, CRERPA, NorthCentral Conservation District, Eastern Conservation District and the CT River and Estuary Conservation District.

For more information please visit their website at: www.easternrcd-ct.org.