

Franc Property Open Space Bethel, Connecticut



King's Mark Environmental Review Team Report

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

**Franc Property Open Space
Bethel, Connecticut**



Environmental Review Report

Prepared by the King's Mark Environmental Review Team

**Of the
King's Mark
Resource Conservation & Development Area, Inc.**

**For the
Conservation Commission
Bethel, Connecticut**

March 2013

Report #357

Acknowledgments

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

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

The field reviews took place on Wednesday, May 9, 2012.

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*Sean is/has provided assistance outside of the ERT process.

I would also like to thank Beth Cavagna, inland wetlands agent, Don Goodrich, chair, inland wetlands commission, John O'Neill, Bethel Land Trust, and Rich Beardlsey, neighboring landowner, for their cooperation and assistance during this environmental review.

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

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

The Kings Mark RC&D Executive Council hopes you will find this report of value and assistance in developing guidelines for preservation and management.

If you require additional information please contact:

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Introduction

Introduction

The Bethel First Selectman has requested Environmental Review Team (ERT) assistance in reviewing the newly purchased Franc Open Space Property.

The Franc Property, recently purchased by the town of Bethel, consists of +72 acres located south of Plumtrees Road and east of Old Hawleyville Road. The Town of Newtown town line and Brunot Preserve (77 acres) forms the eastern boundary. The property has an agricultural past with old pasture, fields, woods roads; as well as wetlands, watercourses and forest stands.

Objectives of the ERT Study

The town is requesting assistance in taking an inventory of the natural resources of this property which was purchased for open space. Their first steps in determining what types of recreation, education and passive uses are appropriate is to have a better understanding of the basic components of this diverse site. Guidelines for its preservation and management will aid the town in being good stewards of the property.

The ERT Process

Through the efforts of the Bethel First Selectman this environmental review and report was prepared for the Town of Bethel.

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

The review process consisted of four phases:

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

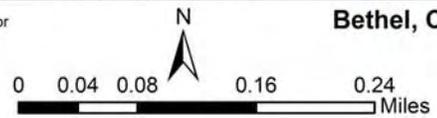
The data collection phase involved both literature and field research. The field review was conducted Wednesday, May 9, 2012. Several team members made additional field visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

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

Franc Property Open Space Aerial Map



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 2012.



Bethel, CT

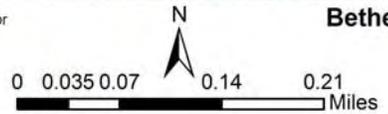
Franc Property Open Space Color Aerial Map



The Connecticut Environmental Review Team



This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team. This map is for educational use only. It contains no authoritative data. April 2012.



Bethel, CT

Topography and Geology

The parcel consists of an eastern forested upland and a western lowland that contains meadows (Figure 1). The western lowlands are underlain by sand and gravel deposits whereas the uplands are underlain by thick glacial till to the north and to the south, thin glacial till that may have a couple of ledge exposures poking through. An extensive area of ledge is exposed just south of the parcel. A small stream, a tributary to Limekiln Brook, has its headwaters in wetlands east of the parcel; the stream flows across the parcel in a moderate valley, and then exits the parcel near the southwest corner. The stream gradient is about 200 ft/mile. The valley through which it flows was likely eroded through thick glacial till by a glacial meltwater stream. The highest elevation on the parcel is just greater than 600' at the southeast corner; the lowest elevation is just less than 450' where the stream exits the parcel along the western boundary. Slopes on the parcel are generally moderate to gentle except in the immediate stream valley where some steep slopes exist.



Figure 1. Topographic contours (C.I.=10 ft) superposed of 2008 areal photography. The green line is the boundary between the towns of Bethel on the west and Newtown.

Surficial Geology The uplands are covered with glacial till, thick in some places, deposited during the last Ice Age, and the lowlands are filled with stratified deposits formed by glacial melt-water streams as the Ice Age was ending (see Figure 2).

Glacial till forms as debris (mud and various sized stones) is plastered under the glacier while the glacier is still active (referred to by some as “lodgment till”) and as debris is left behind by the melting ice during the end of the ice age (referred to by some as “melt-out till.”). The entire parcel is covered by glacial till. The northern part of the parcel has thick till (greater than 50’ thick) and probably contains till deposits from an older ice age as well as till left during the most recent ice age.

A prominent valley was eroded by glacial meltwater across the middle of the parcel. The meltwater stream that caused the erosion was probably initially held in place by left over ice. Perhaps the stream initially flowed through a crevasse in the ice to establish a valley across the thick till. The stream valley today has small terrace deposits several feet above the modern stream.

The meadows on the parcel are underlain by sand and gravel deposits that were formed by meltwater streams flowing down the valley and into a glacial lake. The lake backed up behind temporary dams of till and other debris left at the front of the melting glaciers. When a channel was finally eroded through the dam the meltwater streams eroded some of the previously deposited sand and gravel, leaving terrace deposits.

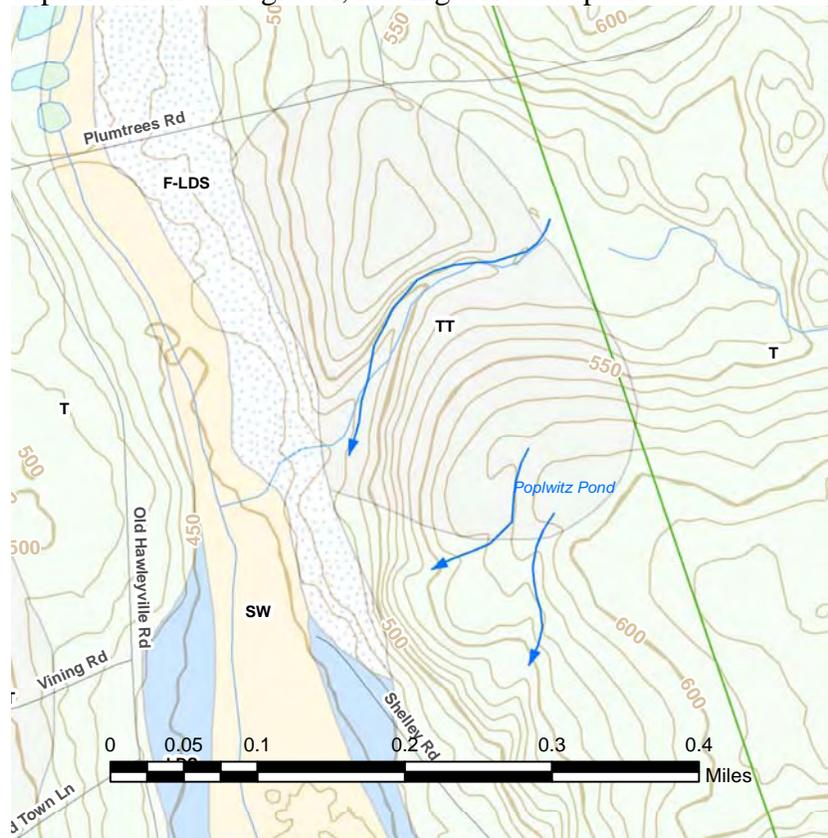


Figure 2. Surficial geologic map of the parcel and surrounding area (approximately same area shown in Figure 1). Light green area (labeled T) is covered by thin till, grayish green area (labeled TT) covered by thick till. Blue-stippled area (labeled F-LDS) underlain by fluvial deposits graded to glacial Lake Danbury (blue deposits south of parcel labeled LDS). Blue arrows indicate meltwater stream channels. Outcrop area described in later section located between two southern meltwater channels. Possibly meltwater from these channels eroded the till exposing the underlying ledge. The valley bottom filled with swamp and other flood-plain sediments (yellow, labeled SW). Map from Stone and others, 2005.



Figure 3. a. Small terraces on the bottom of the valley eroded by a glacial meltwater stream. The modern stream is undercut, has an armored bed, and did not erode the valley through which it flows. **b.** Meadows on glacial meltwater stream deposits in the low part of the parcel.



Figure 4. a. Fluvial deposits about 20-25 feet above the valley bottom deposited by a glacial meltwater stream. **b.** Meltwater stream terrace on east side of the parcel's low area.

Bedrock Geology

The general area is underlain by Ratlum Mountain Schist, Brookfield Gneiss, and Ordovician Granite. Only the Ratlum Mountain schist underlies the parcel. No outcrops of the schist were found within bounds of the parcel. A large area of ledge is found, however, just south of the parcel's southern boundary and, therefore, is on private property (Figure 5). The rock consists of interfoliated sillimanite-bearing schistose-gneiss (Figure 6a) and fine-grained biotite-plagioclase gneiss (Figure 6b), both of which are intruded by microcline-quartz pegmatite (Figure 6b). The rocks are highly deformed and most likely isoclinally folded (Figure 7).

According to Rodgers, 1985, the ledge is part of the Connecticut Valley Synclinorium of the Iapetus (Oceanic) Terrane. The rocks originated as sedimentary layers of the continental slope and ocean bottom off the east coast of the ancestral North American continent around 450 million years ago. The layers were subjected to several metamorphic episodes associated with plate tectonic collisions. During the metamorphism, high temperatures and pressures resulted in

mineral recrystallization. Some of the rock started to melt, forming silicic magma which collected into pockets and formed pegmatite upon cooling.



Figure 5. Outcrop of schist and gneiss just south of the parcel. Slopes are steep in this outcrop area.



a.

b.

Figure 6. Major rock types that crop out in area. **a.** Fine-grained biotite-quartz- plagioclase gneiss. Thin compositional bands of plagioclase and quartz separated by slight biotite rich bands. This rock contains insufficient mica for designation as a schist. **b.** Biotite schist with scarce garnet; sillimanite bearing. Light rock on right side of image is coarse-grained pegmatite that cross-cuts the schistosity of the dark rock.



a.



b.



c.

Figure 7. Fold deformation shown in rock. a. Moderate synformal scale fold can be seen with steeply dipping foliation on left side that folds around at the bottom. b. Moderate scale isoclinal antiform fold with dark colored biotite schist forming core and light colored fine-grained gneiss showing z- folds on left limb and s- folds on right limb. c. Small scale crenulation folds in biotite schist. Light-colored pearly minerals are sillimanite.

References

Rodgers, John, 1985, *Bedrock Geological Map of Connecticut*. State Geological and Natural History Survey of Connecticut, Nat'l. Resource Atlas Series, 1:125,000, 2 sheets.

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

Figure 1: NCSS soil map



The soils on the property are primarily well and moderately well drained lodgement till (Paxton, Woodbridge, Montauk), ice deposited material with a hardpan. Small areas of bedrock controlled ablation tills are also present in the till landscape (Charlton, Chatfield) as well as a wetland consisting of poorly drained Ridgebury soils and organic soils (Timakwa, Natchaug). On the western border of the property are some glacialfluvial deposits (outwash sands and gravels) associated with the stream and wetland identified as Scarboro muck. They occur in a narrow band between this wetland the upland sloping till soils. (A soils report prepared in 2007 for a proposed subdivision may be found in the Appendix.)

Figure 2: Mapunit legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, extremely stony	2.7	3.8%
12	Raypol silt loam	0.2	0.2%
15	Scarboro muck	6.4	9.0%
17	Timakwa and Natchaug soils	1.9	2.6%
21A	Ninigret and Tisbury soils, 0 to 5 percent slopes	2.8	4.1%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	5.0	7.0%
29C	Agawam fine sandy loam, 8 to 15 percent slopes	2.1	3.0%
32B	Haven and Enfield soils, 3 to 8 percent slopes	1.4	1.9%
38C	Hinckley gravelly sandy loam, 3 to 15 percent slopes	6.6	9.2%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	0.1	0.1%
45C	Woodbridge fine sandy loam, 8 to 15 percent slopes	3.1	4.4%
73C	Chariton-Chatfield complex, 3 to 15 percent slopes, very rocky	4.8	6.4%
73E	Chariton-Chatfield complex, 15 to 45 percent slopes, very rocky	2.3	3.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	11.8	16.5%
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	20.2	28.4%
Totals for Area of Interest		71.3	100.0%

Soils suitable for vegetable crops are few and limited to very small areas. The limitations include steepness (slopes), stoniness, wetness, and droughtiness (gravels). It would be difficult to site a community garden on the property, and would require a water supply for irrigation.

The property has potential for many recreational and educational uses. The open and abandoned areas in the northwest quarter of the property are suitable for various landscape projects including native plantings, wildlife plantings, and a buffer planting along the wetland boundary. The topography, trees, and proximity to the road make this a good area for a picnic area as well. Most of the property, with the exception of very steep areas and wetlands, are suitable for hiking trails. Three types of wetland soils occur on the property: the shallow organic soil Scarboro near the western boundary and the poorly drained mineral soil Ridgebury transitioning to the deep organic soils Timakwa and Natchaug in the woods along the eastern border. They offer a good educational range of soils, hydrology, vegetation, and wildlife potential. All are easily accessible from trails or open areas and would be suitable for boardwalks and interpretive signage.

Figure 3: Wooded wetland with soil and vegetation transition.



No major soils concerns, such as excessive erosion or contamination, were observed on the property.

Vegetation Resources

The Franc Property Open Space Study ERT covers a 72 acre parcel of which 64 acres is considered forested. A forest reconnaissance of the site was conducted during two field visits in May of 2012. This process entails laying out the properties boundaries on a recent aerial photo, dividing the property into forested and non-forested portions, visiting each area and noting the vegetation that occurs there. The forested portion of the property is further divided into forest stands. In each the stand the forest vegetation type, size and arrangement is noted. The physical characteristics of the land such as aspect, slope, terrain, drainage, accessibility from roads, operability of equipment, and evidence of past land use activities are also noted.

The property is bounded by town roads on two sides, Plumtrees Road in the north, Old Hawleyville Road in the west, and Shelly Road in the southwest. The eastern boundary is the Bethel/Newtown town line and conservation property owned by the Newtown Forest Association. The southern boundary is along private property and conservation property owned by the Newtown Forest Association. The predominant land use of the area is single family homes.

The aspect of the subject property is varied, along Old Hawleyville Road it is easterly, along Plumtrees Road it is westerly and southerly, and along Shelly Road it is westerly and northerly. The elevation on the property ranges from 450 feet at Shelly Road to 600 feet at the southeast corner of the property. The slopes on the property range from 0 to 20 percent. The steeper slopes are in the south central and central portions of the property.

The property's drainage consists of two perennial watercourses and their associated wooded swamps located in the western and southern portions of the property.

Access to the property is via three driveways on the south side of Plumtrees Road. The main access is the western driveway leading to a farm road. The past land use of the property was agriculture and forest land. There is evidence of gravel extraction in the southwest portion of the property at the end of Shelly Road.

Vegetative Cover Type Description

The property's vegetative cover type can be divided into two non-forest stands and three forest stands (See Vegetative Cover Map).

The non-forest stands are located in the northwest portion of the property along Plumtrees Road. The stands include three acres of open field and five acres of old field and fence rows. The open field stand (F) is made up of three areas where periodic mowing has kept an herbaceous ground cover present. The old field stand (OF) is comprised of treed fence rows surrounding the open fields and adjacent fields reverting to forest. Trees growing in the fence rows are large diameter mixed hardwoods with spreading crowns. Species include white oak, red oak, red maple, sugar maple, white ash, and shagbark hickory. Eastern red cedar is the most common conifer species present in the type. Trees in the areas reverting to forest are saplings and poles of red maple, white ash, red oak, sugar maple, hickory, and red cedar.

Shrub species present are staghorn sumac, multiflora rose, Japanese barberry, winged euonymus, Japanese honeysuckle, autumn olive, winterberry, spicebush, highbush blueberry, red stemmed dogwood, and elderberry. Vine species present are poison ivy, grape, oriental bittersweet, and Virginia creeper.

The remaining 64 acres of forest cover can be broken down into three forest stands which are comprised of a two acre forest swamp (FS), an eight acre wetland forest (WF), and a 54 acre mixed oak forest (MOF).

The forested swamp is located in the northeast portion of the property and abuts the property boundary along the Bethel/Newtown town line. The swamp forms part of the headwaters of the unnamed perennial brook flowing southwesterly through the property. The main canopy of the stand is formed by sawtimber and pole timber sized mixed hardwood trees. Species present are white ash, black ash, red maple, American elm, black gum, and swamp white oak. The mid canopy is occupied by pole timber and saplings of the upper canopy species and shrubs. The shrub species present are spicebush, winterberry, highbush blueberry, buttonbush, sweet pepper bush, witch hazel, arrowwood, and Japanese barberry. The forest floor is occupied by tussock sedge, sensitive fern, cinnamon fern, skunk cabbage, and Jack-in-the-pulpit.

The wetland forest stand is comprised of two areas of inland wetland soil types. The first area is located east of Old Hawleyville Road and north of Shelly Road along a perennial watercourse flowing south from Plumtrees Road. The area is five acres in size. The second area is three acres in size and is located west of the property boundary along the Bethel/Newtown town line and the forested swamp. The area follows the second unnamed perennial watercourse. The main canopy of the stand is occupied by sawtimber and poletimber of red maple, white ash, black gum, American elm, and black cherry. The lower canopy is comprised of shrub species of spicebush, winterberry, winged euonymus, multiflora rose, Japanese barberry, and witch hazel. The terrain in both areas is stony and wet.

The mixed oak forest type is located in the northeastern and southeastern portions of the property along with a five acre portion along the western boundary of the property. The main canopy is dominated by mixed oak sawtimber. The oak species present are black, red, white, chestnut, and scarlet. Other hardwood species present are red maple, sugar maple, hickory, beech, black birch, yellow birch, and white ash. Red cedar is found in the main canopy especially in the northeastern portion of the stand. The mid canopy is occupied by poletimber and saplings of red oak, white oak, red maple, black birch, beech, and sugar maple. The lower canopy is occupied by shrub species of witch hazel and huckleberry, and seedlings of beech. In the southeastern portion of the stand is a five acre area which burned about five years ago. The fire appeared to be hot enough to kill the understory plants and cause wounding of the trunks of the overstory trees.

Management Considerations

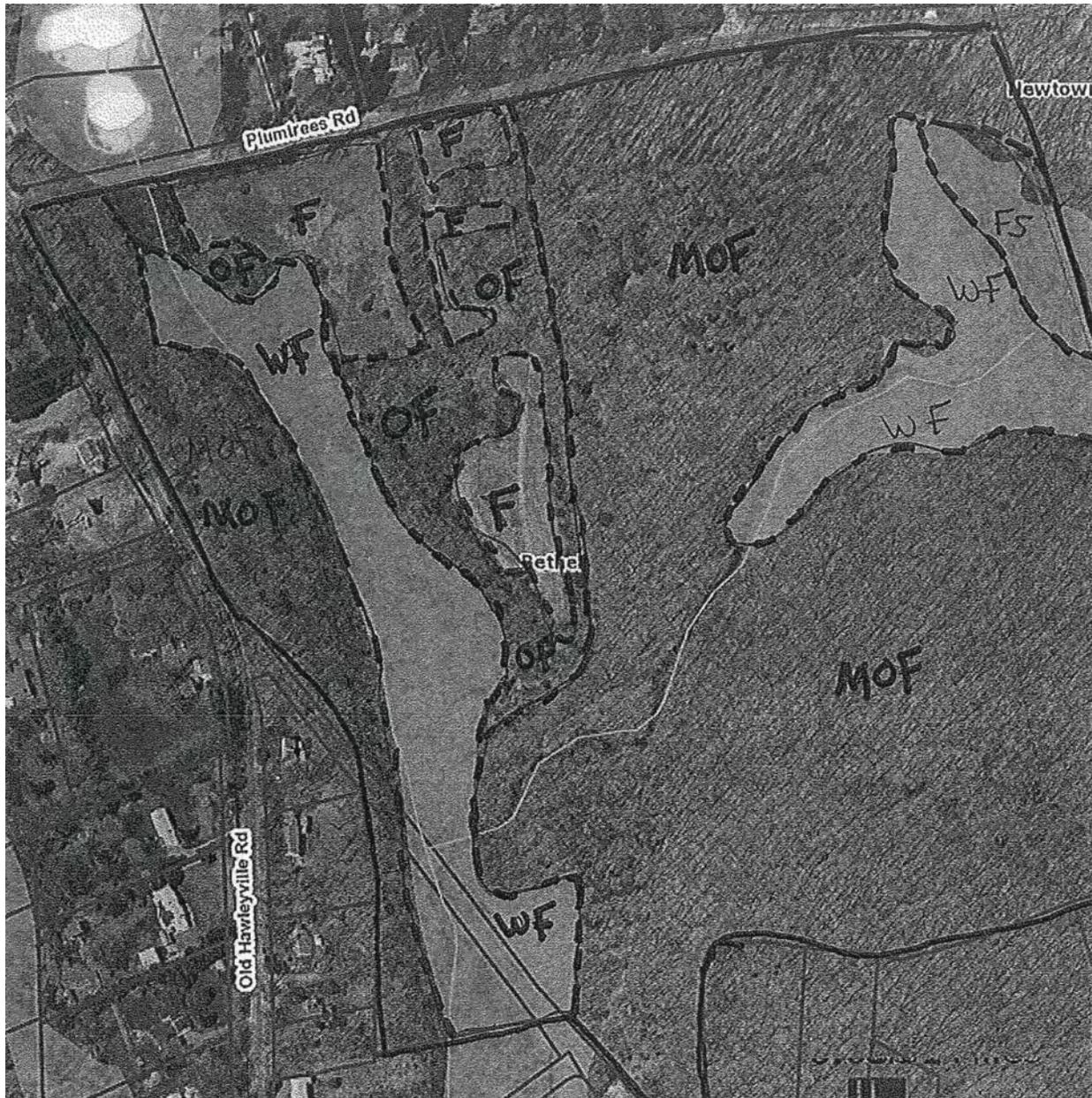
The first rule in forest stewardship is that you can't manage your forest if you don't know where it is. This is the case for this property. The boundary lines were not marked on the ground and existing signage from abutting property owners were the only evidence of property lines. The property's boundaries should be located and marked on the ground before any other management

activity take place or the area is opened to the public. Refer to the University of Connecticut Cooperative Extension System Forest Stewardship Fact Sheet Number Two,” Knowing Your Boundaries” for instructions on boundary line location and maintenance.

<http://www.store.uconn.edu/available-downloads/cooperative-extension-publications/category/4-environment.html>.

The development of a Forest Stewardship plan by a certified forester should be the next step in managing the property. Attached is an outline of the components and definitions of a Forest Stewardship plan. The DEEP Division of Forestry’s Private and Municipal Lands Program would be available to assist the Town of Bethel in developing a Forest Stewardship plan for the Franc Property. Contact Larry Rousseau, Service Forester, phone (860) 485-0226 or email Lawrence.rousseau@ct.gov for assistance.

Vegetative Cover Type Map



Legend

- F** Field – 3 acres
- OF** Old Field – 5 acres
- FS** Forest Swamp – 2 acres
- WF** Wetland Forest – 8 acres
- MOF** Mixed Oak Forest – 54 acres

FOREST STEWARDSHIP PLAN COMPONENTS AND DEFINITIONS

IDENTIFICATION	
<i>Plan Component</i>	<i>Definition</i>
Landowner information	Name, address, and phone number (not required if unlisted or owner does not have one) of forest owner (to be placed on the title page of the plan).
Plan preparer information	Name, address, and phone number of professional natural resource manager who prepared the plan (to be placed on the title page of the plan).
Plan preparation date	The date that the plan was presented to the landowner for acceptance (to be placed on the title page of the plan).
Location description, or directions to site	A description of how to find the site; i.e., survey information, tax map information, or specific written directions to the site (to be placed on the title page of the plan).
Stewardship acres	The number of acres covered by the plan.
Landowner goals for the property	A list of the landowner's goals for owning and managing forest land.
Regional context information	Location of the property in relation to the national ecoregional map developed by Robert G. Bailey, USDA Forest Service (1994), OR, a simple statement about the forest location in relation to surrounding land uses, OR the "watershed address".
General property description	A property overview giving general location, major forest types, general landforms, relevant descriptions of the landscape, etc. (usually one paragraph).
Interaction with surrounding properties	Describe stewardship activities within the context of the neighborhood and how interdependency may affect management.
Maps of the property (GIS-based map sets can be provided at no cost)	An aerial photo, drawing, or map that contains stand delineations, roads, boundaries, water, etc., clearly and adequately labeled. Include legend, north arrow, and scale bar.
Known threatened and endangered species	Review statewide database for possible presence of threatened and endangered (T&E) species (state and Federal listings). If T&E species are present, suggestions should be made for their protection and habitat enhancement. If no T&E species are found, note this in the general description or stand description.
Cultural heritage databases checked (if available) or field observations noted	Check with CT cultural databases that list archeological or other cultural sites of importance that should be noted in the plan. If nothing is found just note it. Your forester can do these database checks.

Soils information	Describe how soils may affect the attainment of landowner goals. (Can be generalized over the entire property when soils are uniform.)
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DESCRIPTION

<i>Plan Component</i>	<i>Definition</i>
Stands by cover type and area (acres)	A description of forest stands in terms of cover type and acreage.
Description of dominant vegetation	List trees by species and size class within the stand.

DESCRIPTION (continued)

<i>Plan Component</i>	<i>Definition</i>
Stand characteristics, based on a reliable field inventory. <i>*(These items are included when management for timber products is a landowner goal.)</i>	A reliable field inventory is any sampling technique that will provide similar results when replicated in the same place. This item is not scored separately but is apparent from the following 6 items.
Stand age	The general age of a stand, as determined by measurement or growth models.
Stand health	A statement describing the health and condition of the forest, including noted problems such as insects, diseases, site hazards, or stocking.
Site quality	A statement describing the site capability for supporting forest growth and associated flora and fauna.
Stocking	A description of the relative population of trees within a stand on a per acre basis. This can be expressed in trees per acre or basal area, along with terms such as “overcrowded” or “under utilized” as long as these terms are clear to the forest owner.
*Stand volume	An expression of the amount of usable wood that is contained in the standing trees, expressed as board feet per acre, cords per acre, cubic feet per acre, or tons per acre.
*Timber quality	A statement indicating the quality of the timber (acceptable, undesirable, or cull).
*Growth rate	The growth produced by the forest on a /acre/year basis, measured by increment borings, growth models, or permanent CFI plots. Expressed as a unit growth/acre/year or as a percent of the residual stand.
Stand history	A statement regarding the past use of the stand. Sources of information include the landowner, observation, old photos and neighbors.

Integrated items	<p>For a landowner interested in enhancing his/her land in a particular use, this will be a fundamental, well-developed part of the stewardship plan. In cases where the landowner's interests do not include enhancing the property's other potential uses, the plan should still offer the landowner a brief description of "what might be" if all options were pursued.</p> <p>No matter what the landowner's goals are, the following 5 potential use items should be discussed.</p>
Habitat and wildlife use	The potential use of the stand by wildlife, as well as ways to minimize any negative impacts on wildlife of management activities.
Water quality issues	A statement addressing any water quality issues that might be occurring in the forest and suggestions for optimizing impacts of management activities on water quality. May include references to BMPs or AMPs.
Timber production potential	This requirement can be met by including a non-technical description of the site's relative potential; for example: "The combination of climate, soils, drainage, and topography present here result in a site well suited to tree growth and timber production." Although timber production may not be the owner's first priority, this will communicate available options to the landowner.
Recreational opportunities	<p>Recreational use is one of the primary goals of forest owners in the Area. Development of trails, vistas, feeding stations, hunting areas, and fishing piers are some of the practices that have been recommended in plans. In some areas, sites will have little to no recreation potential, in which case an acknowledgement of that would be appropriate and sufficient.</p> <p>This element is one that helps ensure that plans address multiple benefits.</p>

DESCRIPTION *(continued)*

<i>Plan Component</i>	<i>Definition</i>
Important natural features	The amount of description needed to satisfy this requirement will depend on the particularities of each site. Dramatic views, rock formations, waterfalls, scenic meadows, rivers, streams, etc., if present, should be described and taken into account in plan formulation. A site that has no particular features that distinguish it from other sites can be described in the following manner: "Beyond the description provided above, this property or ownership does not have any particular natural features requiring additional mention."

RECOMMENDATIONS

<i>Plan Component</i>	<i>Definition</i>
Long-range silvicultural objectives for each forested cover type or stand	Describe clearly and succinctly the silvicultural objectives of each stand as they relate to the landowner's goals.
Schedule for completion of prescribed activities	A schedule for and descriptions of prescriptions and activities that will take place over the next 5 years or 10 years to achieve long-range objectives. See Activity Schedule example below, which illustrates the form to use for either 5 or 10 years of activity. Under the minimum standards, only 5 years of activity is required.

ACTIVITY SCHEDULE

Landowner: *Mr. Example*

Planning Horizon: *10 years*

Date: *August 12, 2001*

ACTIVITY LOCATION Unit Numbers	PRIORITY	TIME PERIOD	ACTIVITY
9	1	Fall 2002	Maintain fence to protect seedlings until white pines are over 5 feet tall.
9, 10, 6, 5, and 4	1	Fall 2003	Develop trail access.
1 and 8	2	Spring 2003	Prepare site, plant white pine and red oak seedlings, and fence to protect from deer.
4 and 5	1	Winter 2003	Treat grapevines, and do crown-touching release of timber crop.

COMMUNICATION

Plan Component

Definition

Management Unit Analysis Table

Summarizes stands (management units) by area, site class, cover type, description, management objectives, and recommended management activities; see following example. A table should still be prepared even if only one management unit is identified.

COMMUNICATION *(continued)*

MANAGEMENT UNIT ANALYSIS TABLE

Mgmt Unit	Acres	Site Quality	Cover Type	Description	Management Objective	Management Activity
1	8.0	Dry to moderately moist	Mixed hardwoods	Reverting old field, white oak, sassafras, black cherry, and black walnut	Convert low-value hardwood unit to white pine and red oak	Prepare site; plant white pine and red oak; fence to protect seedlings from deer.

2	4.4	Dry to moderate ly moist	Oak-hickory	White oak, black oak, chestnut oak, hickory, and small sawtimber	Regenerate to higher value hardwoods	Treat grapevines; treat culls; establish desirable regeneration; harvest timber.
3	16.0	Dry to moderate ly moist	Mixed hardwoods	Reverting old field, red maple and yellow poplar	Convert low value hardwood unit to white oak and red oak	Prepare site; plant white oak and red oak; fence to protect seedlings from deer.

<i>Plan Component</i>	<i>Definition</i>
OPTIONAL Summary paragraph from landowner profile that evaluates landowner's available Time, Interest, Money, and Energy (TIME)	The TIME element is a useful tool for both the plan preparer and the landowner. Including it in the stewardship plan gives the landowner a clear understanding of the assumptions made by the plan's author in its preparation – assumptions that, if incorrect, could impact on plan implementation. "Landowner prefers to do the work himself over a long period of time" or "Cost share programs are of strong interest to the landowner and will be vital in the completion of these practices" are examples of appropriate statements. Plan preparers may devise their own system for assessing landowner's capabilities.
Easy-to-follow logical format	The plan is formatted in such a way that the reader can logically follow the flow of ideas, and will understand what should be completed and why.
The writing style is easy to read and understand.	Readability is subjective, but most people can agree on a well-written plan.
The writer avoids wordiness, jargon, and mistakes in grammar and spelling.	A missing comma, mis-capitalized word, absent parentheses, some use of jargon, a misspelled word, or incorrect grammar should not result in a "Not Acceptable" rating. If the plan on the whole contains few errors of this nature, it should be rated as successfully meeting this element.
The plan meets the landowner's needs and provides useful advice in a skillful way.	While this is probably the most subjective of the elements, the peer review/consensus process should be able to resolve any conflicts of opinion.
The plan is likely to inspire the landowner to action.	Does the plan meet or exceed the landowner's expectations? Does it help the landowner better appreciate the potential of the property and inspire action to fulfill that potential? Reviewers should consider their ratings for the previous three elements in rating this standard.

Wildlife Resources

Background

The Franc Property, recently been purchased by the Town as open space, consists of approximately 72 acres located south of Plumtrees Road, east of Old Hawleyville Road, and adjacent to Brunot Preserve owned by the Newtown Forest Association. The property contains multiple habitat types, including fields, forest, brooks and wetlands. The town is interested in an assessment in order to determine how best to preserve and manage of the property as well as to assist in determining what uses are appropriate. Site visits were conducted on May 9 and June 8, 2012.

Existing Wildlife Habitat

Fields

There are two small fields located in the northwest portion of the property, approximately 1.5 and 0.8 acres respectively. The fields are bordered by forested wetlands to the west, and upland forest to the east and the south. Early successional habitats including fields, as well as 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 early successional species, including eastern box turtle (reported onsite by Christopher Mangels), milk snake, and bronze copper (butterfly).



The habitat value of the existing fields can be increased through management activities. Controlling the invasive species, including autumn olive and multiflora rose, will keep these species from becoming the dominant vegetation and should result in an increase in plant diversity. A more diverse plant community that contains grasses, weeds and flowers, including purple coneflower, black-

eyed susan, and New England aster, is more useful to a wider variety of species, including Eastern bluebird, blue-winged warbler (heard on site) and smooth green snake. In order to keep saplings and small trees from encroaching into the field, brush hogging or mowing should be

implemented every couple of years. Mowing should be conducted after August and before April in order to allow any nesting species to complete their reproductive cycle, and, rather than mowing both fields in the same year, it should be done in alternating years for each field, leaving some cover for the winter season. Additional early successional field habitat can be created by removing the hedgerow, as well as the groups of trees found between the fields, resulting in one large field, rather than the two small fields that currently exist. Alternating portions of the new, larger field should be left un-mowed each winter. This would provide more resources to a wider variety of species, allowing for use by those species whose habitat requirements may not be met by the small size of the individual fields.

Forest and Shrubland

This area contains mature deciduous forest, with an overstory of black birch, oaks, and red maple. Forested areas such as these are valuable to wildlife, providing food (berries, buds, acorns, seeds, catkins), cover, nesting and roosting places, and denning sites. Mast produced by oaks provides excellent forage for a wide variety of mammals and birds including white-tailed deer, gray squirrel, eastern chipmunk, white-footed mouse, eastern wild turkey and blue jay. Trees, both living and dead, also serve as a home for a variety of insects, which, in turn, are eaten by many species of birds, including woodpeckers, warblers and nuthatches. Other wildlife species found in this habitat type include American redstart, barred owl, red-tailed hawk (seen on site), redback salamander and eastern garter snakes.

The southwest portion of the property contains an area that was reported to have burned in the past. Currently, this area has some oak regeneration with a developing shrub understory of viburnum and blueberry. Given the amount of forested habitat on the property, and the proximity of this portion of the property to open fields found on the adjacent Newtown Forest Association property, it would be beneficial to wildlife to encourage this area to grow into



shrubland. This can be accomplished by removing overstory trees (although it is recommended to leave the white oaks, as they provide good mast), allowing a thick viburnum/blueberry understory to fill in. This would add to the mosaic of habitat types found on the property and help meet the habitat needs of those species that require multiple habitat types. Maintaining this area as shrubland, and, if possible, expanding it through additional cutting would benefit many declining shrubland-dependent species,

including the New England cottontail, currently a candidate for listing under the Endangered Species Act (please see www.newenglandcottontail.org the Appendix for further information on this species).

Wetlands

There are several wetlands found on the property, providing an additional habitat component that further increases the wildlife value of the property as a whole.

Wetlands include an unnamed east-west stream surrounded by upland forest in the center portion of the property and an unnamed north-south stream in the western portion of the property surrounded by forested wetlands. Many species of reptiles and amphibians, such as the gray tree frog and the spotted salamander, use wetlands for breeding and spend the balance of their time in the adjacent forested uplands. Many bird species use forested wetlands at varying times of the year for breeding, feeding and shelter. Examples include wood thrush, northern water thrush, and eastern phoebe. Other wildlife likely utilizing this habitat for food and cover are raccoons, star-nosed moles, wood frogs, pickerel frogs, spring peepers and northern water snakes.

Riparian habitat, or riparian zone, is the area of trees, shrubs and herbaceous plants that follow the edge of streams, rivers, lakes and ponds. It provides habitat for many aquatic-based species including frogs, salamanders, toads, ducks, beaver, muskrats, and mink. Generally, the greater the vegetative diversity along the edges of watercourses, the greater the value for wildlife. This zone of vegetation provides valuable cover, nesting sites, roosting sites and, in many cases, abundant food for wildlife.



The vegetation found in this habitat is tolerant to periodic flooding and its presence causes floodwater to slow down and allows the soil to absorb the excess water.

Streams such as those found on this property also provide important travel corridors for mammals. This zone of vegetation along a stream or river is often the only remaining contiguous vegetation within a developed area, especially in a densely populated state like Connecticut. It may continue for miles, providing an important travel corridor for wildlife and connecting one habitat to another.

Education, Nest boxes, and Trails

It is recommended that the town include an educational component as part of their management of the property. Interpretive signs can be placed throughout the trail system and bluebird nest boxes with educational signs can be installed around the field areas. Boxes should be properly designed, maintained, and should include predator guards on mounting posts to prevent predation by raccoons, snakes or domestic cats. Boxes should be inspected regularly.

If recreational trails are to be maintained and improved upon, care must be taken in order to prevent disturbance to wildlife. Please see Attachment A regarding recommended guidelines for

trail establishment. While these guidelines are primarily used for developing new trails, there are recommended practices that can be implemented on existing trails. Trails should not bisect the 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 town purchase of the Franc property provides an opportunity to manage valuable habitat for a variety of wildlife species. The property includes fields that, if expanded and managed properly can provide benefits to wildlife. The adjacent areas, including the wetlands, forested riparian zone, and the forested uplands 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.

References

Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: A Guide for the Northeast. The Northeast Upland Habitat Technical Committee and the Massachusetts Division of Fisheries & Wildlife. 2006.

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)*

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.

Preliminary Botanical Inventory and Habitat Assessment

On May 9, 2012, this reviewer conducted a botanical survey of the Franc Property (FPB), an open space parcel recently acquired by the Town of Bethel (TOB), as part of a multi-disciplinary effort by Connecticut Environmental Review Team. This brief survey had several objectives: (1) a preliminary floristic inventory, focusing on vascular plants; (2) identification of any rare or significant species, plant or animal; (3) overall assessment of the parcel's natural features, with particular interest toward exemplary occurrences of natural communities. The field review was mostly devoted to general site reconnaissance.

FPB is located to the immediate southeast of the intersection of Old Hawleyville Road and Plumtrees Road between the Stony Hill and Codfish Hill sections of Bethel, which lies within the state's Southwest Hills ecoregion. The parcel covers 72+ acres, ranging from less than 450 feet to roughly 620 feet in elevation, with a predominantly western aspect and south to southwesterly drainage. FPB comprises a wide array of habitat types, including an open field complex, mesic to dry oak-dominated upland forest, and portions of two deciduous basin swamps connected by a bouldery, forested stream course. Although review of historical records or archival aerial photography prior to the site walk was beyond the scope of this survey, clear evidence of a history of pastoral use in the form of wolf and dead standing Red cedar trees, stonewalls and remnant wire fencing was found. Current land usage is passive; other than a network of trails, walls and one small footbridge, no structures exist onsite. Surrounding land is primarily low-density residential to the north and west, while preserved lands of Bethel Land Trust and Newtown Forest Association abut to the south and west, respectively.

In terms of vascular flora, survey results suggest FPB supports a typical to somewhat elevated level of species richness for a parcel of its size and regional location, with 149 plant species compiled in the field or from collections (see attached list). Casual incidental observations on other groups of organisms, such as birds, lichens and bryophytes, appear to be consistent with this finding. An abundance of physical/structural features such as rock outcroppings, snags and decaying logs contribute considerable fine-scale habitat variety and raise the overall level of potential biodiversity onsite. Additional fieldwork is clearly needed to elucidate and substantiate these findings.

With respect to natural communities, arguably foremost in terms of ecological significance are the wetland communities, which together form part of the Limekiln Brook system, a major tributary of the Still River, which in turn feeds the Housatonic River and is perhaps the key hydrologic feature of the Southern Marble Valley sub-ecoregion. Although no dolomite/ marble bedrock or erratics were seen, some degree of calcareous influence was evident in the flora, particularly in the sugar maple-dominated seepage forest found near the confluence of the two stream courses in the southwest sector of the parcel.

As for other survey objectives, one State-listed species was identified: an individual Eastern box turtle (*Terrapene carolina*) was observed at the southeastern edge of the old-field complex (see attached reporting form in the Appendix). According to data provided by CT-DEEP, this is not the only extant occurrence of this species within Bethel, although it seems there are no other known locations nearby (no data were obtained for Newtown, however). At least one bird designated an

“At-risk” species by CT-DEEP (Wood thrush) was heard and may be breeding onsite. Given the brevity of this survey, it is not surprising that no other listed species were found; considerable potential nonetheless exists for finding additional fauna and/or plant species.

In addition to enduring effects of historical land usage, more recent and in places obviously ongoing unnatural disturbance in the form of littering, ground fires, and soil scarification/ erosion was observed. It should also be noted that a substantial fraction (~19%) of the observed plant diversity comes from non-native species. While the majority of these are confined to modified habitats such as the access road, footpaths and old fields, some are notoriously invasive species; control efforts should be planned for if the parcel is to be maintained as a natural area, minimally at the present level of quality. However, despite these detractions, the prevalence of largely natural plant communities, observed plant species richness and other qualitative factors such as degree of buffering and connectivity with surrounding landscape collectively suggest that FPB retains moderately high ecological integrity, and as such is an important parcel at the county/ecoregional landscape level.

This survey represents a preliminary effort, and therefore should not be regarded as a conclusive study, particularly with respect to presence/absence of rare species. Additional inventory work that (1) extends over the course of at least one entire growing season and (2) includes invertebrate and vertebrate faunal groups as well as flora should be conducted, particularly if changes to current land use such as a public accessible trail system are anticipated. Future management efforts by the town should encompass as much of FPB as resources will allow, and be coordinated with management efforts being applied on adjacent natural areas. Highest priority should be given to maintaining forest and riparian wetland integrity, *e.g.*, through minimizing runoff and soil erosion, and removing invasive species. Other possible options include grassland/shrubland bird and herptile habitat enhancement.

**List of Vascular Plant Species Observed at Franc Parcel, Bethel
(Based on field notes and collections, C.R. Mangels, 9 May 2012)**

<u>Species name</u> ¹	<u>Common name</u> ²	<u>Habitat location</u> ³
<i>Acer rubrum</i>	Red maple	WS
<i>Acer saccharum</i>	Sugar maple	WS
<i>Achillea millefolium</i> *	Yarrow	UO
<i>Alliaria petiolata</i> *	Garlic mustard	WS
<i>Allium tricoccum</i>	Wild leek	WF
<i>Alnus</i> species	Alder	WO
<i>Amelanchier</i> species	Shadbush	UF
<i>Amphicarpaea bracteata</i>	Hog-peanut	UF, WF
<i>Anemone quinquefolia</i>	Wood anemone	WF
<i>Antennaria neglecta</i>	Pussy-toes	UF
<i>Anthoxanthum odoratum</i> *	Sweet vernal grass	WS
<i>Apocynum cannabinum</i>	Hemp dogbane	UO
<i>Aralia nudicaulis</i>	Wild sarsaparilla	UF
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	WF
<i>Artemisia vulgaris</i> *	Mugwort	AR
<i>Athyrium filix-femina</i>	Lady fern	WS
<i>Berberis thunbergii</i> *	Japanese barberry	UF, WF
<i>Betula alleghaniensis</i>	Yellow birch	WF
<i>Betula lenta</i>	Black birch	UF
<i>Betula populifolia</i>	Gray birch	WO
<i>Caltha palustris</i>	Marsh marigold	WF
<i>Cardamine diphylla</i>	Two-leaf toothwort	WF
<i>Carex albicans</i> var. <i>emmonsii</i>	Bellow-beaked edge	UF
<i>Carex albursina</i>	White bear sedge	UF
<i>Carex appalachica</i>	Appalachian sedge	UF
<i>Carex blanda</i>	Woodland sedge	UF
<i>Carex bromoides</i>	Brome-like sedge	WF, WO
<i>Carex debilis</i>	White-edged sedge	UF
<i>Carex digitalis</i>	Slender woodland sedge	UF
<i>Carex folliculata</i>	Long sedge	WF
<i>Carex ?laxiculmis</i>	Spreading sedge	UF
<i>Carex laxiflora</i>	Broad loose-flower sedge	UF
<i>Carex pennsylvanica</i>	Pennsylvania sedge	WS
<i>Carex prasina</i>	Drooping sedge	WO
<i>Carex rosea</i>	Rosy sedge	WS
<i>Carex sparganioides</i>	Bur-reed edge	UF
<i>Carpinus caroliniana</i>	Hornbeam	WF, UF
<i>Carya ovata</i>	Shagbark hickory	UF
<i>Carya</i> species	Hickory	UF
<i>Celastrus orbiculatus</i> *	Oriental bittersweet	WS
<i>Centaurea</i> species *	Knapweed	UO

<i>Cerastium dubium</i> *	Chickweed	WS
<i>Chelone glabra</i>	Turtlehead	WF
<i>Chimaphila maculata</i>	Spotted wintergreen	UF
<i>Cinna</i> species	Wood reed	WF
<i>Clinopodium vulgare</i>	Wild basil	UO
<i>Corylus</i> species	Beaked hazel	UF
<i>Dactylis glomerata</i> *	Orchard grass	WS
<i>Danthonia</i> species	Poverty-grass	UF
<i>Daucus carota</i> *	Queen Anne's-lace	UO
<i>Dendrolycopodium obscurum</i>	Flat-branched tree clubmoss	UF
<i>Dennstaedtia punctilobula</i>	Hay-scented fern	WS
<i>Dichanthelium</i> species	Panic grass	UF
<i>Diphasiastrum digitatum</i>	Southern ground-cedar	UF
<i>Dryopteris intermedia</i>	Common wood fern	WS
<i>Dryopteris marginalis</i>	Marginal wood fern	UF
<i>Elaeagnus umbellata</i> *	Autumn olive	UO
<i>Erigeron pulchellus</i>	Robin's-plantain	UO
<i>Erigeron</i> species	Fleabane	UO
<i>Erythronium americanum</i>	American trout lily	UF
<i>Euonymus alatus</i> *	Winged burning bush	UF
<i>Euonymus fortunei</i> *	Climbing spindle-tree	AR
<i>Eurybia divaricata</i>	White wood aster	UF
<i>Fagus grandifolia</i>	American beech	UF
<i>Fragaria virginiana</i>	Wild strawberry	UO, UF
<i>Galium mollugo</i> *	White bedstraw	WS
<i>Galium</i> species	Bedstraw	WO
<i>Gaylussacia baccata</i>	Black huckleberry	UF
<i>Geranium maculatum</i>	Wild geranium	UF
<i>Geum</i> species	Avens	WF
<i>Glyceria</i> species	Manna grass	WF
<i>Hamamelis virginiana</i>	Witch-hazel	UF, WF
<i>Hylotelephium telephium</i> *	Sedum	UF
<i>Ilex verticillata</i>	Winterberry	WF
<i>Impatiens capensis</i>	Spotted jewelweed	WF, WO
<i>Juncus effusus</i>	Soft rush	WO
<i>Juncus tenuis</i>	Slender yard-rush	WS
<i>Juniperus virginiana</i> var. <i>virginiana</i>	Red cedar	UF
<i>Lactuca</i> species	Lettuce	UO
<i>Laportea canadensis</i>	Wood-nettle	WF
<i>Lonicera</i> species	Honeysuckle	WF
<i>Lonicera morrowii</i> *	Fly honeysuckle	WS
<i>Luzula multiflora</i> ssp. <i>multiflora</i>	Common woodrush	UF
<i>Maianthemum canadense</i>	False lily-of-the-valley	WF, UF
<i>Malus pumila</i> *	Common apple	UF, UO
<i>Melampyrum lineare</i>	Cow-wheat	UF
<i>Monarda fistulosa</i>	Wild-bee-balm	UO

<i>Mitchella repens</i>	Partridgeberry	UF, WF
<i>Nasturtium officinale</i> *	Water-cress	WF
<i>Nyssa sylvatica</i>	Sour gum	WF
<i>Oclemena acuminata</i>	Mountain aster	UF
<i>Onoclea sensibilis</i>	Sensitive fern	WF, WO
<i>Osmunda cinnamomea</i>	Cinnamon fern	WF, WO
<i>Ostrya virginiana</i>	Hop hornbeam	UF
<i>Packera aurea</i>	Golden ragwort	WF, WO
<i>Packera obovata</i>	Ragwort	UF
<i>Panax trifolius</i>	Dwarf ginseng	WF
<i>Parthenocissus quinquefolia</i>	Virginia creeper	WS
<i>Persicaria arifolia</i>	Halberd-leaf tear thumb	WF
<i>Persicaria longiseta</i> *	Creeping smartweed	WS
<i>Plantago lanceolata</i> *	English plantain	UO
<i>Plantago rugelii</i>	Pale plantain	WS
<i>Poa compressa</i> *	Canada bluegrass	UF, UO
<i>Polygonatum biflorum</i>	Small Solomon's-seal	UF
<i>Polypodium</i> species	Rock polypody	UF
<i>Polystichum acrostichoides</i>	Christmas fern	UF
<i>Populus grandidentata</i>	Big tooth aspen	UF
<i>Potentilla simplex</i>	Common cinquefoil	WS
<i>Prenanthes</i> species	White rattlesnake-root	UF
<i>Pycnanthemum</i> species	Mountain-mint	UO
<i>Quercus alba</i>	White oak	UF
<i>Quercus montana</i>	Chestnut oak	UF
<i>Quercus rubra</i>	Red oak	UF
<i>Quercus velutina</i>	Black oak	UF
<i>Ranunculus abortivus</i>	Kidney-leaf crowfoot	UO
<i>Ranunculus acris</i> *	Tall buttercup	UO
<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Swamp buttercup	WF
<i>Ranunculus recurvatus</i>	Hooked buttercup	WF
<i>Rhododendron periclymenoides</i>	Pink azalea	WF
<i>Rosa multiflora</i> *	Multiflora rose	WS
<i>Rubus allegheniensis</i>	Northern blackberry	UO
<i>Rubus ?flagellaris</i>	Northern dewberry	UF, UO
<i>Rubus occidentalis</i>	Black raspberry	UF
<i>Rumex acetosella</i> *	Sheep sorrel	UF, UO
<i>Sanicula</i> species	Snakeroot	UF
<i>Saxifraga pensylvanica</i>	Swamp saxifrage	WF
<i>Schizachyrium scoparium</i>	Little blue-stem	UO
<i>Solidago caesia</i>	Blue-stem goldenrod	UF, WF
<i>Solidago patula</i>	Spreading goldenrod	WF, WO
<i>Solidago rugosa</i>	Tall hairy goldenrod	WS
<i>Solidago</i> species	Goldenrod	UF
<i>Symplocarpus foetidus</i>	Skunk cabbage	WF, WO
<i>Thelypteris noveboracensis</i>	New York fern	UF, UO

<i>Thelypteris palustris</i>	Marsh fern	WF, WO
<i>Turritis glabra</i>	Tower rockcress	UO
<i>Toxicodendron radicans</i>	Poison ivy	UF, UO
<i>Trientalis borealis</i>	Starflower	UF
<i>Trifolium pratense</i> *	Red clover	WS
<i>Ulmus americana</i>	American elm	WF
<i>Vaccinium corymbosum</i>	Highbush blueberry	WS
<i>Vaccinium ?pallidum</i>	Early lowbush blueberry	UF
<i>Veratrum viride</i>	False hellebore	WF
<i>Veronica officinalis</i> *	Common speedwell	UF
<i>Veronica serpyllifolia</i> *	Thyme-leaf speedwell	UO
<i>Viburnum acerifolium</i>	Maple-leaf viburnum	UF
<i>Viola conspersa</i>	American dog-violet	UF, WF
<i>Viola cucullata</i>	Blue marsh violet	WF, WO
<i>Viola sororia</i>	Common violet	UF
<i>Vitis</i> species	Summer grape	UF, WF

Σ = 149 species

(?) Denotes a tentative species identification

(*) Denotes species regarded as alien to Connecticut (Dowhan, 1979) or of doubtful native origin at this site on basis of New England regional distribution (Haines, 2011)

¹ Nomenclature follows Flora North America (1993+) and/or Haines (2011)

² Common names follow Weldy and Werier (2009) or Haines (2011)

³ Species found in or most associated with the following broad site subdivisions: forested upland (UF); non-forested upland, including old fields (UO); access road/parking area (AR); forested wetland (WF); non-forested wetland (WO). Species noted in multiple sections are designated widespread (WS)

Landscape Ecologist Comments

The Franc Property is a valuable asset for the Town of Bethel for a variety of reasons. On its own it contains multiple habitat types (wetlands, old fields, woodlands of varying ages and species composition, and rock outcrops). Coupled with the adjacent 72 acre Brunot Preserve (owned and protected by the Newtown Forest Association, see map in the Appendix), it makes a contiguous, protected block nearly 150 acres in size.

Although 150 acres is not as large as generally is needed for bird species that prefer large tracts of forest interior, the combined properties offer diverse habitats and a sense of wildness. In the Franc Property, a formal or informal survey of birds present during breeding season (e.g., late May – mid-late June) would add to knowledge about the biodiversity of the area. Such a survey could be conducted along old roads and trails (multiple times during breeding season).



The existing old roads/trails on the Franc Property provide a usable foundation for a trail network. To enable people to get familiar with this jewel in their town, different walking routes could be named and marked in different colors. Naming trails enables people to more easily share their experiences. Trail marking could be done with the assistance of local scouts or other volunteer groups. Where trails are steep, some re-routing might be advisable to help prevent erosion.

Invasive Plants

Invasive plants are present, but have not reached an unmanageable state. Different strategies should be employed in different parts of the tract.

Downloadable invasive plant identification sheets are available at

<http://www.ct.nrcs.usda.gov/invas-factsheets-spanish.html> (good photos and bi-lingual)

<http://www.ct.nrcs.usda.gov/invas-factsheets.html> (additional species).

Forested Area East of the Access Road and Parking Area

This area is relatively free of invasive plants. The best strategy is EDRR – Early Detection and Rapid Response to remove invasives before they develop into big problems. Readily identified invasive species that were observed in the area include:

- Garlic Mustard (*Alliaria petiolata*; some was removed in May 2012)
- Japanese Barberry (*Berberis thunbergii*)
- Winged Euonymus (*Euonymus alatus*; also known as Burning Bush, though in forest shade it does not get so bright red in autumn)
- non-native shrubby Honeysuckle (*Lonicera* sp. – the non-native ones have hollow stems; note that small stems have but a pin-prick’s worth of hollowness)

- Multiflora Rose (*Rosa multiflora*)
- Oriental (Asiatic) Bittersweet (*Celastrus orbiculatus*)

Garlic Mustard control may be done by hand pulling (described in more detail for the Access Road and Parking Area). Where the woody invasives are small and not connected to a well developed root system, they may be pulled by hand or with the aid of a weed wrench or other pulling tool. The above-mentioned woody invasive species are easiest to spot in the Spring and in the Fall because they leaf out earlier than most native shrubs and hold their leaves longer in the Fall. They may be pulled at any time, though pulling is easiest when the soil is moist. They are most likely to become problematic at forest edges or where sunlight reaches into the forest.

Access Road and Parking Area

1. Garlic Mustard (*Alliaria petiolata*)

Garlic Mustard is the most important invasive plant to control in the access road and parking area (as well as in the forest). It is found both on the access road and in the parking area (as well as within the old field area). This species spreads easily by seeds carried by hikers, car tires, and animals that brush by the seed pods. Although it can be eaten as an early season green or made into pesto, it is an unwanted plant because it out-competes spring ephemeral wildflowers. There also is laboratory evidence that chemicals exuded from its roots are harmful in regard to the establishment of woody plant seedlings.

Garlic Mustard is a biennial that makes an inconspicuous number of leaves the first year. Early in the second year, it shoots up a stalk with small white flowers that soon produce seed pods. Once the seeds are produced, the plant dies; brownish seed pods and decaying leaves are a typical sight in July.



Garlic Mustard may be controlled by hand pulling. Once there are flowers, it should be bagged rather than tossed aside because the root and stalk of pulled plants have enough stored energy to allow seed pods to develop. Bags may be disposed of as trash – never as compost or mulch.

It should be a priority to control this plant in the parking area and along the access road to prevent it from being spread into the forest to the east where there are relatively few invasive plants. The month of May is a good time to go looking for it.

Knowing that Garlic Mustard is present along the access road, it would be possible to spot the first year growth. Not all first year plants survive so in some ways it is not efficient to pull young plants. However, when people willing to pull plants are present, it is better to pull them than to hope someone will be around the next year.

Garlic Mustard seeds can survive more than five years in the ground. Therefore, even if every plant is removed before it goes to seed, the site should be revisited in subsequent years.

2. Swallow-wort {non-flowering specimens not identified as to species; either Black Swallow-wort (*Cynanchum louiseae* – formerly *Vincetoxicum nigrum*) or Pale Swallow-wort (*Cynanchum rossicum* – formerly *Vincetoxicum rossicum*)}

Two small patches were noted, one on each side of the access road after it passes between stone walls just beyond the parking area where the old field habitat begins. This plant may be more widespread than was noted.



Swallow-worts are vines that grow aggressively over other vegetation. Seeds may be spread by mowing equipment. Plants are very difficult to completely pull up; and uprooted plants may re-root themselves if left on the ground. Attention to this species may be best left to a professional. In the meantime, care should be taken to prevent wheeled vehicles from moving seeds.

3. Mugwort (*Artemisia vulgaris* – currently (6/2012) under

review for possible addition to the Connecticut State list of Invasive and Potentially Invasive plants)

A small patch was noted on the west side of the access road in the vicinity of the Swallow-wort located to the south of the stone walls that border the old agricultural fields just beyond the parking area.

Although this plant is not currently listed as invasive in Connecticut, it produces thick vegetation that outcompetes other plants and is not a desirable species for wildlife habitat. Where established, the plant aggressively spreads vegetatively.



Isolated plants may be pulled when young. (Note that some people get a rash from handling the plant.) Once an infestation is well-established, it is difficult to get all the roots with handpulling.

Old Field Areas

The open fields and re-growing agricultural areas contain a variety non-native species, including invasive plants. The overall invasive plant management strategy for the old field area will depend on the management goals for the area. Any control of invasive species in the area should avoid possible harm to the Eastern Box Turtle (*Terrapene carolina*).

Garlic Mustard may be controlled by hand pulling, though it is much more important to concentrate on the access road and early detection in the forest. However, note that visitors who come frequently to an area can make a big difference over time if they pull a few invasive plants each time they pass through.

The degree to which Swallow-worts (*Cynanchum* sp.) and Mugwort (*Artemisia vulgaris*) are spread throughout the area was not investigated. These are highly undesirable plants because of their ability to push out other species. Care should be taken with equipment that is capable of moving root fragments to new sites.

Old Field Area Habitat

Field edges and thickets are among the habitat types favored by Eastern box turtles (*Terrapene carolina*), a species of Special Concern in Connecticut. With one sighting of an Eastern box turtle on the property, it would be worth surveying the area for more. Eastern box turtles generally do not move great distances. However, people have been known to move Box turtles from one place to another (thus the discovery of one Box turtle does not necessarily indicate that others might be present). To promote Eastern box turtles, a wildlife biologist or other person knowledgeable in their habitat needs of should be consulted for management of the old field habitat type.

Although it is visually tempting to mow the old fields and treat them as grasslands or meadows, the upland habitat type that is most fast disappearing from Connecticut is shrublands. Connecticut's climate is suited to forests; thus, shrublands created by habitat disturbances that remove trees (for example, natural fire, agriculture land abandonment, and logging) will naturally grow back into forest as tree seedlings and sprouts thrive.

A shrubland requires infrequent, but active, maintenance to prevent the site from being taken over by trees. Invasive shrubs and woody vines such as Autumn-Olive (*Elaeagnus umbellata*), Multiflora Rose (*Rosa multiflora*), Japanese Barberry (*Berberis thunbergii*), Winged Euonymus (*Euonymus alatus*) and Oriental (Asiatic) Bittersweet (*Celastrus orbiculatus*) represent less than ideal species, but they should not be removed *en masse* without consideration of whether the loss of shrub cover is less desirable than the presence of invasive shrubs. Planting with native shrub species is an option. The degree to which native plantings will be successful depends not only on the control of impinging invasive plants, but also on the number of deer in the area. Fencing may be needed.

Appendix

Air Photo – Franc Property

JMM Wetland Consulting Services, LLC On-site Soil Investigation Report (2007)

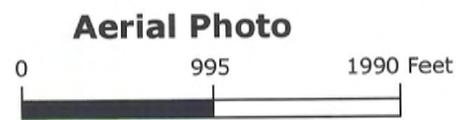
The Brunot Preserve Map – Newtown, CT

New England Cottontail Information



Town of
Bethel, CT

Parcel ID: 86 70 01
Owner: FRANC FRANK



JMM WETLAND CONSULTING SERVICES, LLC

25 Church Hill Road, 2nd Fl.
Newtown, CT 06470
Phone: 203-364-0345

REPORT DATE: May 11, 2007

PAGE 1 OF 3

ON-SITE SOIL INVESTIGATION REPORT

PROJECT NAME & SITE LOCATION:

Proposed Project Site
Plumtrees and Old Hawleyville Roads
Bethel/Newtown, Connecticut

JMM Job No.: 07-918-BET-1

Field Investigation Date(s): 4/28, 5/3, 5/6/07

Field Investigation Method(s):

- Spade and Auger
 Backhoe Test Pits
 Other: _____

REPORT PREPARED FOR:

Mr. Matthew Reynolds, L.S.
New England Land Surveying, P.C.
118 Coal Pit Hill Road
Danbury, CT 06810

Field Conditions:

Weather: Sunny, 70's
Soil Moisture: moderate
Snow Depth: n/a
Frost Depth: n/a

Purpose of Investigation:

- Wetland Delineation/Flagging in Field
 Wetland Mapping on Sketch Plan or Topographic Plan
 High Intensity Soil Mapping by Soil Scientist
 Medium Intensity Soil Mapping from SCS Soil Survey Maps
 Other: _____

Base Map Source: Fairfield County NRCS web soil survey (attached)

Wetland Boundary Marker Series: JMM-1 to JMM-166, JMM-A-1 to JMM-A-48, JMM-B-1 to JMM-B-84, JMM-C-1 to JMM-C-16, and JMM-X-1 to JMM-X-8 (closed loop)

General Site Description/Comments: The site is located south of Plumtrees Road, east of Old Hawleyville Road, and northeast of Shelley Road. This undeveloped 72 +/- acre site consist of old pasture fields, many farm and wood roads, and forested upland and wetland areas, which include perennial watercourses. It should be noted that the majority of the site is located in Bethel with roughly 9-acres located in Newtown. It is worthwhile noting that the majority of the site is forested with the exception of the northwesterly part, which is the location of the open fields. The soil types were found to be undisturbed and derived from glacial outwash (i.e. stratified, sand and gravel) deposits and glacial till (i.e. unstratified sand, silt, and rock) deposits. The "upland type" soils are comprised of the well drained Agawam (29) and Paxton (84) soil series, and the moderately well drained Ninigret (21) and Woodbridge (45) soil series. The "wetland-type" soils were identified as the poorly drained and the very poorly drained Ridgebury, Leicester, and Whitman (3) soil series mapping complex, the poorly drained Raypol (12) soil series, and the very poorly drained Scarboro (15) soil series. The "regulated areas" associated with the site consist of two perennial watercourses and their associated wooded swamp wetlands located in the western and southern portions of the site. Additionally, a small wooded and shrubby swamp is located in the northwestern part of the site adjacent to a farm road (C-series) and an isolated wooded swamp (X-series) located on the northeastern property line. Typical vegetation observed included such species as red maple, elm, spicebush, barberry, arrowwood, tussock sedge, sensitive fern, cinnamon fern, skunk cabbage, and Jack-in-the-pulpit to name a few.

ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)

PROJECT NAME & SITE LOCATION: Plumtrees and Old Hawleyville Roads
Bethel and Newtown, CT

SOIL MAP UNITS

Wetland Soils

Ridgebury fine sandy loam (2). This soil series consists of deep, poorly and somewhat poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically these soils have a black sandy loam surface layer 6 inches thick. The mottled subsoil from 6 to 16 inches is olive gray sandy loam. The mottled substratum from 16 to 60 inches is a light olive brown and olive, very firm and brittle gravelly sandy loam.

Leicester fine sandy loam (4). This series, which in some Connecticut counties is found only in complex with the Ridgebury and Whitman series, consists of deep, poorly drained loamy soils formed in friable glacial till on uplands. They are nearly level to gently sloping soils in drainage ways and low-lying positions on till covered uplands. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically, these soils have a surface layer of black fine sandy loam 6 inches thick. The subsoil from 6 to 23 inches is grayish brown, mottled fine sandy loam. The substratum from 26 to 60 inches or more is dark yellowish brown, mottled, friable, gravelly fine sandy loam.

Whitman fine sandy loam (3). This series, which in some Connecticut counties is only mapped in complex with the Ridgebury and Leicester series, consists of deep, very poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level and gently sloping soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically these soils have a black fine sandy loam surface layer 8 inches thick. The mottled subsoil from 8 to 15 inches is gray sandy loam. The mottled substratum from 15 to 60 inches is firm, olive gray to gray dense glacial till.

Raypol silt loam (12). This series consists of deep, poorly drained soils formed in a coarse-loamy mantle underlain by sandy water deposited glacial outwash materials. They are nearly level and gently sloping soils on outwash plains and high stream terraces. The soils formed in loamy over stratified sandy and gravelly glacial outwash derived mainly from acid rocks. Typically these soils have very dark brown, silt loam Ap horizons, grayish brown and dark yellowish brown, mottled, silt loam and very fine sandy loam B2 horizons over light olive brown, mottled gravelly sand IIC horizons at a depth of 29 inches.

Scarboro loam (15). This series consists of very deep, very poorly drained soils formed in sandy water deposited glacial outwash materials. They are nearly level soils on glaciofluvial landforms, typically in low depressions and drainage ways of outwash plains and terraces. The soils formed in a loamy sand lying over stratified sandy and gravelly outwash derived from a variety of acid rocks. Typically these soils have a 9 inch black mucky peat or very dark brown mucky sandy loamy surface layer. The subsurface layer from 9 to 16 inches is gray loamy sand. The substratum from 16 to 60 inches is olive gray, grayish brown and light yellowish brown loamy sand, loamy fine sand and coarse sand. The substratum may be stratified.

Upland Soils

Agawam sandy loam (29). This series consists of deep, well drained soils formed in a coarse-loamy mantle underlain by sandy water deposited glacial outwash materials. They are level to very steep soils on outwash plains and high stream terraces. The soils formed in loamy over stratified sandy and gravelly glacial outwash derived mainly from crystalline rocks. Typically these soils have a dark grayish brown fine sandy loam surface layer 11 inches thick. The subsoil from 11 to 26 inches is dark yellowish brown and light olive brown fine sandy loam. The substratum from 26 to 55 inches is olive and olive brown loamy fine sand. Below 55 inches it is stratified fine sand to gravelly loamy sand.

ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)

PROJECT NAME & SITE LOCATION: Plumtrees and Old Hawleyville Roads
Bethel and Newtown, CT

SOIL MAP UNITS

Ninigret fine sandy loam (21). This series consists of very deep moderately well drained soils formed in a coarse-loamy mantle underlain by sandy water deposited glacial outwash materials. They are nearly level to gently sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainage ways. The soils formed in loamy over stratified sandy and gravelly outwash derived from a variety of acid rocks. Typically, these soils have a very dark grayish brown fine sandy loam surface layer 8 inches thick. The subsoil from 8 to 26 inches is yellowish brown fine sandy loam with mottles below 16 inches. The substratum from 26 to 60 inches is mottled, pale brown, loose, stratified loamy sand.

Paxton fine sandy loam (84). This series consists of deep, well drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to very steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. In tilled areas, these soils have a dark brown fine sandy loam surface layer 8 inches thick. The subsoil from 8 to 26 inches is dark yellowish brown and olive brown fine sandy loam. The substratum from 26 to 60 inches is olive, very firm and brittle gravelly fine sandy loam.

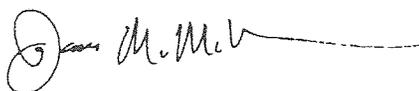
Woodbridge fine sandy loam (45). This series consists of deep, moderately well drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. In tilled areas, these soils typically have a very dark grayish brown fine sandy loam surface layer 7 inches thick. The subsoil from 7 to 30 inches is dark yellowish brown and light olive brown fine sandy loam, mottled below 18 inches. The substratum from 30 to 60 inches is light olive brown, very firm and brittle gravelly fine sandy loam.

Any accompanying soil logs and soil maps, and the on-site soil investigation narrative are in accordance with the taxonomic classification of the National Cooperative Soil Survey of the USDA Natural Resource Conservation Service, and with the Connecticut Soil Legend (DEP Bulletin No.5, 1983). Jurisdictional wetland boundaries were delineated pursuant to the Connecticut General Statutes (CGS Sections 22a-36 to 22a-45), as amended. The site investigation was conducted and/or reviewed by the undersigned Registered Soil Scientist(s) [registered with the Society of Soil Scientists of Southern New England (SSSSNE) in accordance with the standards of the Federal Office of Personnel Management].

All wetland boundary lines established by the undersigned Soil Scientist are subject to change until officially adopted by, local, state, and federal regulatory agencies.

Respectfully submitted,

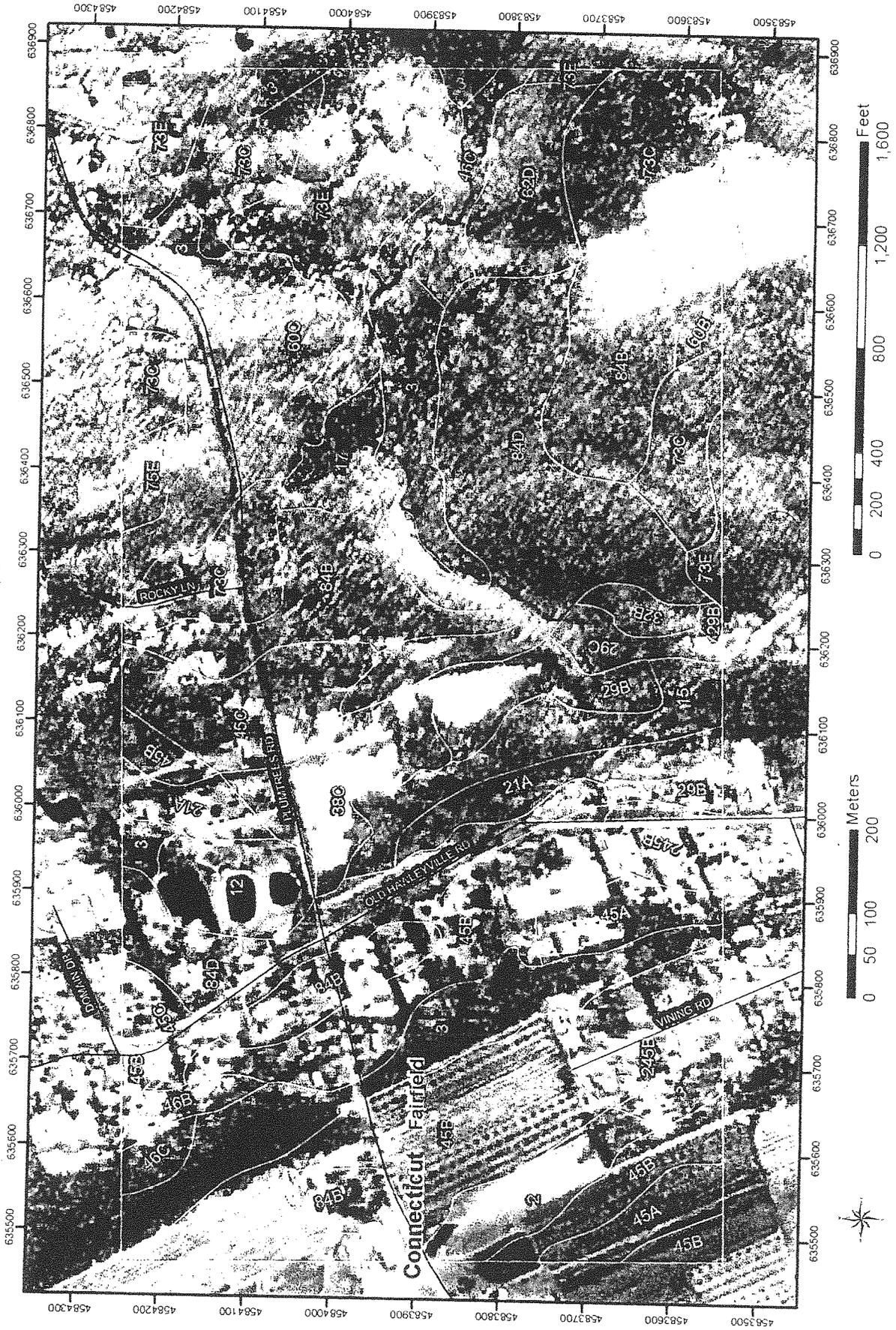
JMM WETLAND CONSULTING SERVICES, LLC



James M. McManus, MS, CPSS
 Certified Professional Soil Scientist
 Field Investigator/Reviewer

SOIL SURVEY OF STATE OF CONNECTICUT

Plumtrees Road, Bethel, CT



SOIL SURVEY OF STATE OF CONNECTICUT

Plumtrees Road, Bethel, CT

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 18
 Soil Survey Area: State of Connecticut
 Spatial Version of Data: 4
 Soil Map Compilation Scale: 1:12000

Map comprised of aerial images photographed on these dates:
 3/31/1991; 4/3/1991

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

MAP LEGEND

- Soil Map Units
- Cities
- Detailed Counties
- Detailed States
- Interstate Highways
- Roads
- Rails
- Water
- Hydrography
- Oceans
- Escarpment, bedrock
- Escarpment, non-bedrock
- Gulley
- Levee
- Slope
- Blowout
- Borrow Pit
- Clay Spot
- Depression, closed
- Eroded Spot
- Gravel Pit
- Gravelly Spot
- Gulley
- Lava Flow
- Landfill
- Marsh or Swamp
- Miscellaneous Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Slide or Slip
- Sinkhole
- Sodic Spot
- Spill Area
- Stony Spot
- Very Stony Spot
- Perennial Water
- Wet Spot

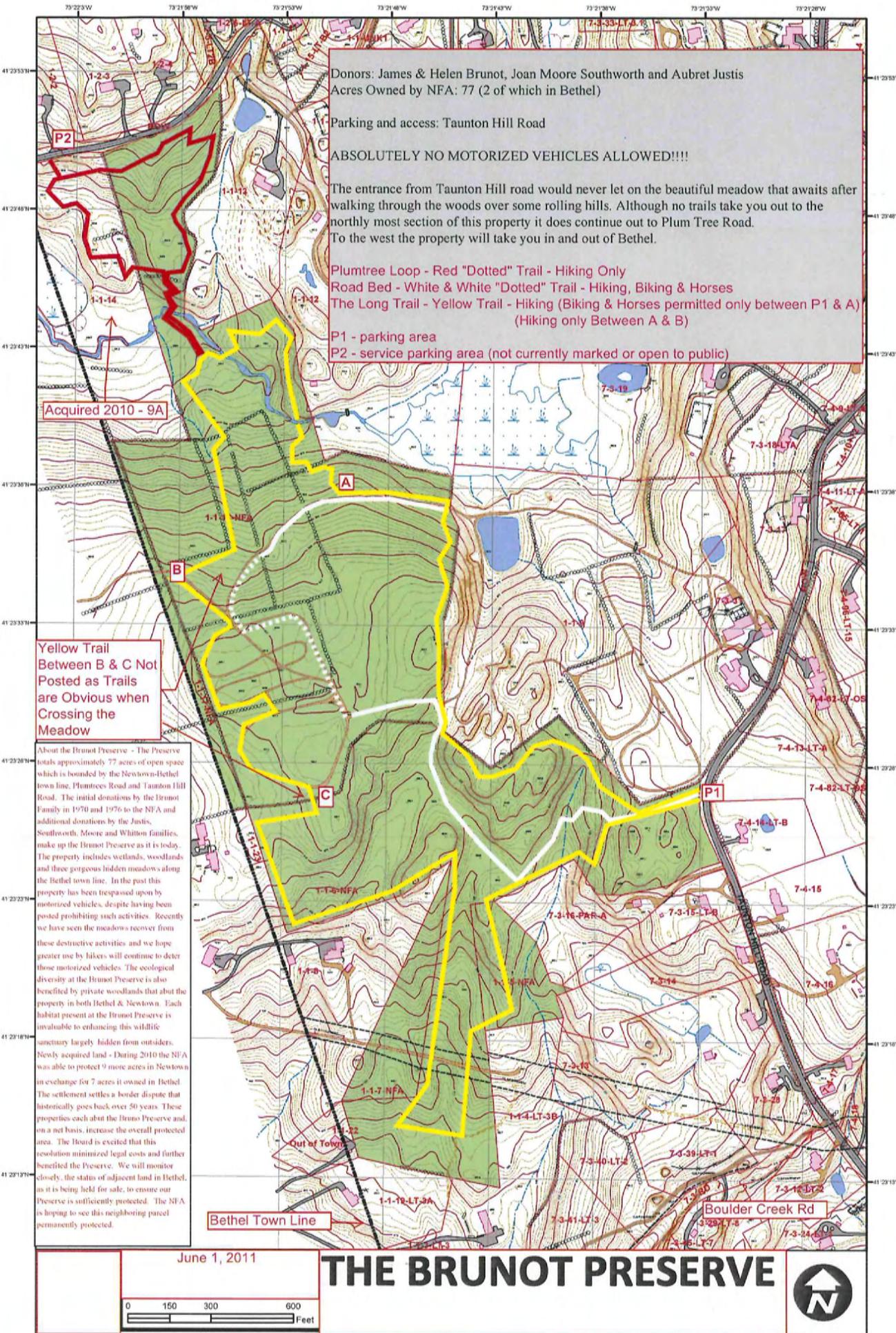
Map Unit Legend Summary

State of Connecticut

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ridgebury fine sandy loam	4.6	1.9
3	Ridgebury, Leicester, and Whitman soils, extremely stony	23.8	9.7
12	Raypol silt loam	4.8	1.9
15	Scarboro muck	6.7	2.7
17	Timakwa and Natchaug soils	2.9	1.2
21A	Ninigret and Tisbury soils, 0 to 5 percent slopes	6.5	2.6
29B	Agawam fine sandy loam, 3 to 8 percent slopes	5.1	2.1
29C	Agawam fine sandy loam, 8 to 15 percent slopes	2.1	0.9
32B	Haven and Enfield soils, 3 to 8 percent slopes	1.4	0.6
38C	Hinckley gravelly sandy loam, 3 to 15 percent slopes	7.5	3.1
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	6.3	2.6
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	31.2	12.7
45C	Woodbridge fine sandy loam, 8 to 15 percent slopes	9.8	4.0
46B	Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	1.7	0.7
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	4.2	1.7
60B	Canton and Charlton soils, 3 to 8 percent slopes	0.7	0.3
60C	Canton and Charlton soils, 8 to 15 percent slopes	3.5	1.4
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	5.8	2.4
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	24.9	10.1
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	26.5	10.8
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	1.8	0.7

State of Connecticut

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	25.0	10.2
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	30.6	12.4
245B	Woodbridge-Urban land complex, 0 to 8 percent slopes	8.6	3.5



Donors: James & Helen Brunot, Joan Moore Southworth and Aubret Justis
 Acres Owned by NFA: 77 (2 of which in Bethel)

Parking and access: Taunton Hill Road

ABSOLUTELY NO MOTORIZED VEHICLES ALLOWED!!!!

The entrance from Taunton Hill road would never let on the beautiful meadow that awaits after walking through the woods over some rolling hills. Although no trails take you out to the northly most section of this property it does continue out to Plum Tree Road. To the west the property will take you in and out of Bethel.

Plumtree Loop - Red "Dotted" Trail - Hiking Only
 Road Bed - White & White "Dotted" Trail - Hiking, Biking & Horses
 The Long Trail - Yellow Trail - Hiking (Biking & Horses permitted only between P1 & A)
 (Hiking only Between A & B)

P1 - parking area
 P2 - service parking area (not currently marked or open to public)

Acquired 2010 - 9A

Yellow Trail
 Between B & C Not
 Posted as Trails
 are Obvious when
 Crossing the
 Meadow

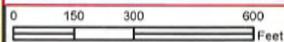
About the Brunot Preserve - The Preserve totals approximately 77 acres of open space which is bounded by the Newtown-Bethel town line, Plumtree Road and Taunton Hill Road. The initial donations by the Brunot Family in 1970 and 1976 to the NFA and additional donations by the Justis, Southworth, Moore and Whitton families, make up the Brunot Preserve as it is today. The property includes wetlands, woodlands and three gorgeous hidden meadows along the Bethel town line. In the past this property has been trespassed upon by motorized vehicles, despite having been posted prohibiting such activities. Recently we have seen the meadows recover from these destructive activities and we hope greater use by hikers will continue to deter those motorized vehicles. The ecological diversity at the Brunot Preserve is also benefited by private woodlands that abut the property in both Bethel & Newtown. Each habitat present at the Brunot Preserve is invaluable to enhancing this wildlife sanctuary largely hidden from outsiders. Newly acquired land - During 2010 the NFA was able to protect 9 more acres in Newtown in exchange for 7 acres owned in Bethel. The settlement settles a border dispute that historically goes back over 50 years. These properties each abut the Brunot Preserve and, on a net basis, increase the overall protected area. The Board is excited that this resolution minimized legal costs and further benefited the Preserve. We will monitor closely the status of adjacent land in Bethel, as it is being held for sale, to ensure our Preserve is sufficiently protected. The NFA is hoping to see this neighboring parcel permanently protected.

Bethel Town Line

Boulder Creek Rd

June 1, 2011

THE BRUNOT PRESERVE





New England Cottontail

Connecticut, Maine, Massachusetts,
New Hampshire, New York,
Rhode Island

Listing Status: Candidate

Focal Area Map

Background

In 2006, the New England Cottontail rabbit (*Sylvilagus transitionalis*) was listed as a candidate species under the Federal Endangered Species Act due to an 86 percent decline in its historic range. New England Cottontail is listed as a priority species for the states in which it occurs (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York), and it is listed as an "endangered" species by state law in Maine and New Hampshire.

The primary threat to the New England cottontail is loss of habitat through succession. As forests mature, understory thins to such an extent that the habitat is no longer suitable for New England cottontail. Fragmentation serves to further degrade habitat on a larger scale. Isolation of occupied patches by surrounding areas of unsuitable habitat, coupled with high predation rates, are causing local extirpation of New England cottontail from small patches.

In order to sustain local populations, New England Cottontail requires at least 25 acres of continuous early successional habitat intermingled with smaller suitable parcels that are 12 or more acres in size. These core areas need to be connected by dispersal corridors or be within the species dispersal distance. Landscape fragmentation, loss of habitat from succession, infestations of invasive plants, and alterations of hydrology, are the most common resource concerns affecting the New England Cottontail.

Working Lands for Wildlife will develop and maintain habitat within priority areas, and work with landowners to support New England Cottontail recovery and conservation of the species.



Resource Concern	Total Acres Needing Treatment
Fish and Wildlife Inadequate Food; Inadequate Cover/Shelter; Inadequate Space; Habitat Fragmentation; Imbalance Among and Within Population; Declining species, Species of Concern	5,000
Plant Condition Noxious and Invasive Plants	3,000

Goals / Objectives

Over the next five years, Working Lands for Wildlife will assist private land owners to create and enhance approximately 2,500 acres of shrub thicket and early successional forest. The habitat improvements will support New England Cottontail recovery and conservation.



Actions

- Brush management and/or herbaceous weed control to manage invasive plants.
- Reestablishment of native woody vegetation.
- Cutting trees and shrubs to encourage dense forest regeneration and rehabilitation of shrublands.
- Restoration of wetland seeps within priority areas.
- Increase connectivity of habitat in core areas.
- Development of Candidate Conservation Agreements with Assurances.

Core Practices

643 Restoration and Management of Rare and Declining Habitats
644 Wetland Wildlife Habitat Management
645 Upland Wildlife Habitat Management
647 Early Successional Habitat Development and Management

Supporting Practices

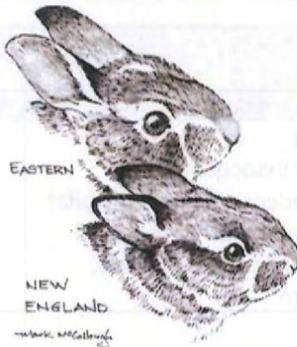
314 Brush Management
315 Herbaceous Weed Control
327 Conservation Cover
338 Prescribed Burning
340 Cover Crops
386 Field Borders
391 Riparian Forest Buffer
394 Firebreak
422 Hedge Row Planting

472 Access Control
490 Tree Shrub Site Preparation
528 Prescribed Grazing
560 Access Road
612 Tree/Shrub Establishment
655 Forest Harvest Trails and Landings
657 Wetland Restoration
666 Forest Stand Improvement

Outcomes and Impacts

Habitat improvements will remove threats and assist with conservation of the species. This work may enable potential down-listing from endangered under Maine and New Hampshire law. In addition, 59 species of greatest conservation need in New England depend on early successional habitats will benefit from this effort.

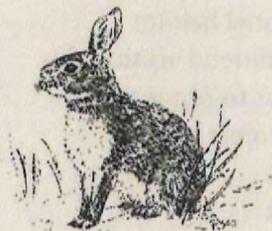
Additional species benefiting in this focal area are: wild turkey, woodcock, deer, bass, trout, salmon, and black bear.



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New England Cottontail Initiative

An update of activities being conducted to benefit this declining species



Welcome to the inaugural issue of the New England Cottontail Initiative Newsletter!

Serving to inform you about current activities and future opportunities to participate in projects benefitting this declining species.

***If you build
it, they will
come-***

The New England cottontail, a candidate for listing under the Endangered Species Act, has experienced significant population declines throughout the northeast, and a large-scale effort has been undertaken to try and reverse this. Loss of habitat has been identified as the main cause; this species requires large patches (25 acres) of tangly, thorny, thick, brushy vegetation. This has become rare in the northeast and, even where found, is ephemeral in nature. Creating large acreages of this habitat type is key to reversing the decline of the species.

Who are we?

Multiple governmental agencies are working collectively to stop the decline in New England Cottontail populations, including the CT DEEP Wildlife Division, the USDA Natural Resources Conservation Service, and the US Fish & Wildlife Service. We are partnering with other organizations, including the Wildlife Management Institute and the National

Fish and Wildlife Foundation, as well as private landowners to put projects on the ground that will increase the amount of habitat available.

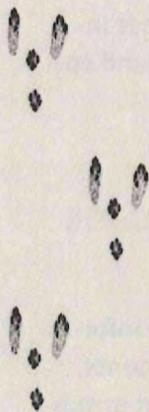
What have we been doing?

Research—Ongoing work includes live trapping, fecal pellet analysis, and roadkill specimen collection to identify areas where New England cottontails currently exist. **Development of Focus Areas**—Existing data was used to create a model that targets the best locations for management work. The twelve Focus Areas identified are shown in the map below.

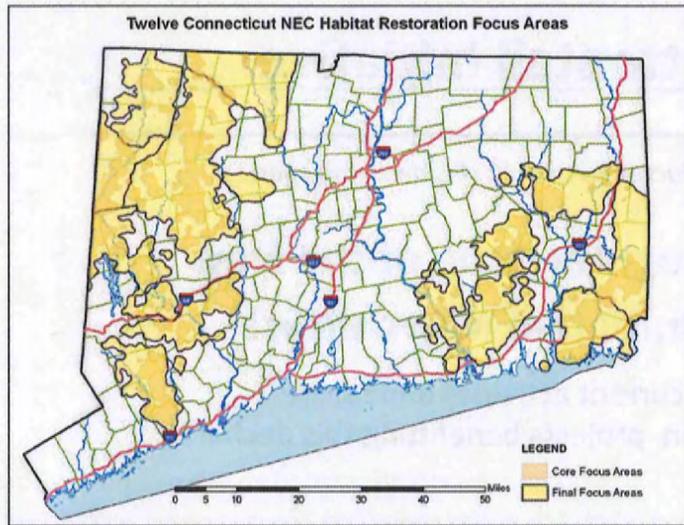
Outreach—We have held several workshops and distributed informational brochures to get the word out to private landowners that we are seeking partners for habitat management projects.

Management—Several projects have already been implemented on state lands including:

- Roraback WMA— 51 acres
- Housatonic WMA—58 acres
- Goshen WMA—70 acres



New England Cottontail Initiative



Camp Columbia WMA—4 acres
A captive breeding program has also been developed, in partnership with Roger Williams Zoo.

What do we hope to do in the future?

Additional state lands projects are scheduled, including:

Spignesi WMA—41 acres
Bartlett Brook WMA—21.8 acres
Bear Hill WMA—30 acres
Pease Brook WMA—22 acres
Sessions Woods WMA—35 acres
Pachaug SF—250 acres

Eight private lands projects, totaling 258 acres, are in various stages of development, located throughout the Focus Areas.

Trapping and pellet collection efforts will continue, as will the captive breeding program and additional workshops will be scheduled.

How can you get involved?

If you think you have a project that may benefit this species, please contact us! We are also interested in collecting specimens (head portion only) whether

lost to injury or taken by hunters. Help get the word out by forwarding this newsletter. Future issues will include announcements of upcoming workshops. If you would like to visit a site and see the what a New England cottontail habitat project looks like, we recommend visiting the Roraback WMA— call us to request a trail map delineating the project site.

Contact Information

For more information, or to discuss a potential project, please contact the following:

- Paul Rothbart
Supervising District Biologist
paul.rothbart@ct.gov
- Lisa Wahle
Wildlife Specialist
lisa.wahle@ct.gov
- Jack Berlanda—
Certified Forester
john.berlanda@ct.gov

Our office location is:
CT DEEP Eastern District HQ
209 Hebron Road
Marlborough, CT 06447
(860) 295-9523

The following websites offer further information pertaining to New England cottontails:

www.newenglandcottontail.org
www.ctnracs.usda.gov/cottontail
www.fws.gov/northeast/indepth/rabbit

What do you think?

We hope you find this newsletter informative and we welcome all comments. To submit recommendations or to unsubscribe, please email robin.adamcewicz@ct.gov.



WILDLIFE IN CONNECTICUT

WILDLIFE FACT SHEET

Cottontail Rabbits

New England Cottontail
Sylvilagus transitionalis

Eastern Cottontail
Sylvilagus floridanus

Background

The eastern cottontail was introduced into New England in the late 1800s and early 1900s and has been expanding its range ever since. The New England cottontail is the only rabbit native to Connecticut. In the mid-1930s, New England cottontails were still considered abundant and more numerous than the eastern cottontail. However, as agricultural areas reverted to forest and these forests matured, populations of both species were reduced. The eastern cottontail is now the predominant species.

The DEEP has been conducting research on New England and eastern cottontails since 2000. Studies have been implemented to determine the distribution of each species, evaluate survival and causes of mortality, estimate home range size, and assess potential competition between the two species. The DEEP Wildlife Division also has assisted in the development of a captive breeding program designed to propagate New England cottontails in captivity for release in states throughout their range to augment or expand existing populations. Habitat enhancement projects have been implemented on several Connecticut state forests and wildlife management areas to expand existing populations.

Range

The New England cottontail occurs in New England west to the Hudson River. The eastern cottontail occurs in the eastern United States and southern Canada south to eastern Mexico and into Central America. Another population is in Texas, New Mexico, and Arizona. The eastern cottontail is more abundant than the New England cottontail. Also, its range is expanding, while the New England cottontail's range is diminishing.

Description

The cottontail rabbit is somewhat stocky, with large hind feet, long ears, and a short, fluffy tail that resembles a cotton ball. Its long, coarse coat varies in color from reddish-brown to grayish-brown. The underparts are white. The New England cottontail weighs between 1.64 and 2.94 pounds and measures from 14.2 to 18.8 inches. The



eastern cottontail weighs between 1.8 and 2.95 pounds and measures from 14.8 to 18 inches.

New England and eastern cottontails are almost identical in appearance, except for a slight variation in color. About half of the eastern cottontail population shows a white, star-like shape on the forehead, while New England cottontails do not exhibit this trait. A comparison of skull characteristics or DNA analysis are the most reliable ways to distinguish the two species.

Habitat and Diet

Eastern cottontails tend to use open fields, meadows, yards, and other grassy areas. New England cottontails prefer early successional forests, often called thickets, with thick and tangled vegetation. These young forests are generally less than 25 years old. Once large trees grow in a stand, the shrub layer tends to become thin, creating habitat that the New England cottontail no longer finds suitable.

In summer, cottontails feed almost entirely on tender grasses and herbs. Crops, such as peas, beans, and lettuce, are also eaten. In winter, bark, twigs, and buds of shrubs and young trees are eaten. Rabbits will also re-ingest their own fecal pellets, increasing their level of vitamins and minerals.

Life History

Breeding occurs from March through early fall. Females do not dig their own nest burrows but rather scratch out a slight depression in the ground in an area of dense grass

for concealment. The nest is lined with fur and dry grass. The gestation period is about 28 days. Cottontails usually have 2 to 4 litters per year with about 3 to 8 young per litter. Young rabbits are born blind, naked, and helpless but grow rapidly, leaving the nest after only 2 to 3 weeks. They are weaned and totally independent at 4 to 5 weeks. On average, 15% of the young will survive their first year. Adults are usually solitary by nature, except when a female is caring for its young.

Interesting Facts

Cottontail rabbits are active all year long, foraging mainly at dusk or night. During the day, they remain concealed in dense brush, protected from predators and harsh weather. In times of extreme weather conditions or to escape predators, rabbits will readily use an abandoned woodchuck burrow, stone walls, brush piles, or other structures for protection. A rabbit's home range varies greatly with the quality of habitat, but generally averages 9 acres. Males have larger home ranges than females.

Cottontails have keen eyesight and hearing. When danger is sensed, a rabbit will usually freeze in place until danger has passed, but it will flush readily if approached too closely. Rabbits normally move slowly in short hops or jumps, but when frightened they can achieve speeds up to 18 miles per hour over a short distance. They often zig-zag to confuse a pursuing predator. Although they do not take to the water often, rabbits are good swimmers.

Rabbits will thump the ground with their hind feet regularly, probably as a means of communication. When playing, breeding, or fighting, they often make low purring, growling, or grunting sounds. If captured by a predator, the animal may produce a loud, shrill scream.

Because of its high productivity rate, the cottontail rabbit is an important link in the food chain and a principal prey item for many species. Depending on its availability, the cottontail can be considered a buffer prey species, meaning if rabbit numbers are high, predators will concentrate on them, thus reducing the pressure on other prey species.

The cottontail rabbit is a popular game species throughout its range. The regular hunting season in Connecticut occurs from fall into winter. Consult the current Connecticut Hunting and Trapping Guide for specific season dates and information. The guide is available at town halls, DEEP offices, and on the DEEP website (www.ct.gov/deep/hunting).

Conservation Concerns – New England Cottontail

A petition was submitted to the U.S. Fish and Wildlife Service (USFWS) in August 2000 to list the New England cottontail as a threatened or endangered species. The USFWS designated the New England cottontail as a candidate for threatened or endangered status in September 2006.

Historically, New England cottontails were distributed statewide in Connecticut, but limited research over the past 50 years has indicated that populations have declined in abundance and distribution in the state and throughout

New England. Biologists believe the reduced extent of thicket habitat is the primary reason for the decline in numbers and range of New England cottontails. Prior to European settlement, New England cottontails were probably found along river valleys where floods and beavers created the disturbances needed to generate its preferred habitat. Forest insect outbreaks, large storms like hurricanes and ice storms, and wild fire also created disturbances in the forest that promoted thicket growth. During colonial times, much of the New England forest was cleared for agriculture and then subsequently abandoned during the early 1900s. This abandoned farmland allowed for a great deal of early successional habitats to develop. Today, these habitats are aging while others have been developed and are no longer suitable for New England cottontails.

The introduction of exotic invasive species, such as multiflora rose, honeysuckle bush, and autumn olive, in the last century has changed the type of habitat available to New England cottontails. These plants form the major component of many patches where cottontails can be found. It may be that stands dominated by non-native species do not provide rabbits with the food resources that native plant species do.

A research project was initiated in Connecticut in October 2000 by the Wildlife Division to document the historic and current distribution of New England and eastern cottontail rabbits. The project involves a statewide collection effort to obtain distribution information of cottontails throughout the state. Four common methods are used to collect data on cottontail distribution: hunter harvest, live trapping, and collection of roadkills and fecal pellets. Dead cottontail specimens are frozen to preserve tissue for future DNA analysis if needed for species identification. An ear sample is collected from all live-trapped rabbits for DNA analysis. Specimens are identified as eastern or New England cottontails by using skull morphology or DNA analysis. To confirm species identification, all intact skulls are skinned and skull morphology is examined.

Since October 2000, cottontails have been collected from 115 (67%) of Connecticut's 169 towns. New England cottontails were found in 26 of the 115 (23%) towns and eastern cottontails were found in 108 of the 115 (94%) towns. Twelve additional towns were documented as having New England cottontails by the University of New Hampshire between 2003 and 2006 through fecal DNA analysis.

The New England cottontail continues to be the subject of research and habitat management in Connecticut, New York, and the other New England states. Halting the decline of scrub and brushland habitat is paramount, as is identifying potential habitat free of competing eastern cottontails to which New England cottontails could be restored. Working together, state and federal agencies may help improve the chances of survival for the New England cottontail.

The U.S. Fish and Wildlife Service provided some of the information used to compile this fact sheet (www.fws.gov).



State of Connecticut
Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division
www.ct.gov/deep/wildlife



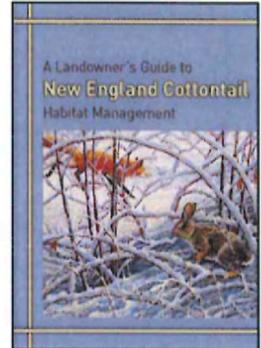
This publication is partially funded by the Federal Aid to Wildlife Restoration Program. Funds are provided through an excise tax on the sale of sporting firearms, ammunition, and archery equipment.

New England Cottontail (NEC) Websites and References

NEC/Habitat Specific:



- CT DEEP Young Forest & Shrubland Initiative
 - http://www.ct.gov/deep/cwp/view.asp?a=2723&q=514596&deepNav_GID=1655
 - CT DEEP Wildlife Factsheet: Cottontail Rabbits
 - A Landowner's Guide to New England Cottontail Management
http://www.ct.gov/deep/lib/deep/wildlife/pdf_files/habitat/yfshrubinitiative/NECHabitatMgmtGuide.pdf
 - NEC Project newsletter
 - NRCS WLFW NEC Factsheet

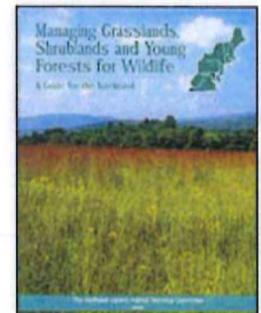


- Wildlife Management Institute (WMI)
 - <http://www.newenglandcottontail.org/>
 - <http://www.timberdoodle.org/>
 - <http://www.youngforest.org/>

- NH Fish & Game: Habitat Guide
 - http://www.wildlife.state.nh.us/Wildlife/Northeast_Hab_Mgt_Guide.htm



- U.S. Fish & Wildlife Service
 - <http://www.fws.gov/northeast/indepth/rabbit/index.html>



Technical Assistance, Mapping & General Information:

- Mapping assistance
 - <http://www.cteco.uconn.edu/>
 - <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

- Natural Resource Conservation Service
 - <http://www.ct.nrcs.usda.gov/programs/whip/whip.html>
 - <http://www.ct.nrcs.usda.gov/technical/> select CT eFOTG (field office technical guide)
 - <http://www.ct.nrcs.usda.gov/invas-factsheets.html>



- Additional resources
 - <http://www.cipwg.uconn.edu/> (has an updated listing of invasive spp. in CT)



About the Team

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

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

Purpose of the Environmental Review Team

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

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

Requesting an Environmental Review

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

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