Chatham Forest Subdivision

East Hampton, Connecticut

Eastern Connecticut Environmental Review Team Report

Eastern Connecticut
Resource Conservation and Development Area, Inc.

Chatham Forest Subdivision
East Hampton, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut
Environmental Review Team Report

Of the
Eastern Connecticut Resource Conservation and Development Area, Inc.

For the

Planning and Zoning Commission
East Hampton, Connecticut

March 2010

Report #627

ACKNOWLEDGEMENTS

This report is an outgrowth of a request from the East Hampton Planning and Zoning Commission to the Connecticut River and Coastal Conservation District (CRCCD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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

The field review took place on Monday, January 25, 2010.

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**Report not yet received.*

I would also like to thank James Carey, administrator for planning, zoning and building, Kerry Nielson, director of community and environmental planning, John Martucci, engineer, Dutton Associates, LLC, and Mat Pelletier and Joe Pelletier, applicants for the project, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project, concept plans for a conventional and a conservation subdivision layout, location map and aerial photos. During the field review Team members received updated plans for the conservation subdivision. Some Team members made additional visits due to the inclement weather the day of the field review. Following the reviews, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

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

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing this proposed subdivision.

If you require additional information please contact:

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INTRODUCTION

Introduction

The East Hampton Planning and Zoning Commission requested Environmental Review Team (ERT) assistance in reviewing a proposed subdivision.

The Chatham Forest Subdivision is a 42.34 acre site located on Colchester Avenue (Route 16) just east of Tartia Road. The conservation subdivision plans dated 1/25/2010 show a single cul-de-sac road with 15 house lots on approximately 11 acres with +31 acres of open space. The lots will all have individual on-site sewage disposal systems and on-site water supply wells.

The ERT Team was also shown initially a conventional subdivision plan (date 11/23/2009) that had lots accessed from Colchester Road, Tartia Road and a new road with a cul-de-sac.

The property is presently wooded with an extensive wetland system to the west and it abuts state forest to the east.

Objectives of the ERT Study

The town has requested a review of the proposed subdivision to assist town officials in:

- Determining the environmental benefits of the alternative subdivision layout versus the conventional.
- To determine of existing open space assets can be enhanced by the conservation subdivision layout.
- What effects, if any, will the proposal have on the Flat Brook watershed?
- Are there meaningful wildlife concerns to be taken into account?
- Will the lots proposed be adequately served by individual wells without degrading the wetlands onsite?

Other concerns:

- Erosion and sediment control
- Stormwater – protection of Flat Brook
- Adequacy of individual wells
- Wildlife habitat
- Open space

The ERT Process

Through the efforts of the East Hampton Planning and Zoning Commission this environmental review and report was prepared for the Town of East Hampton.

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

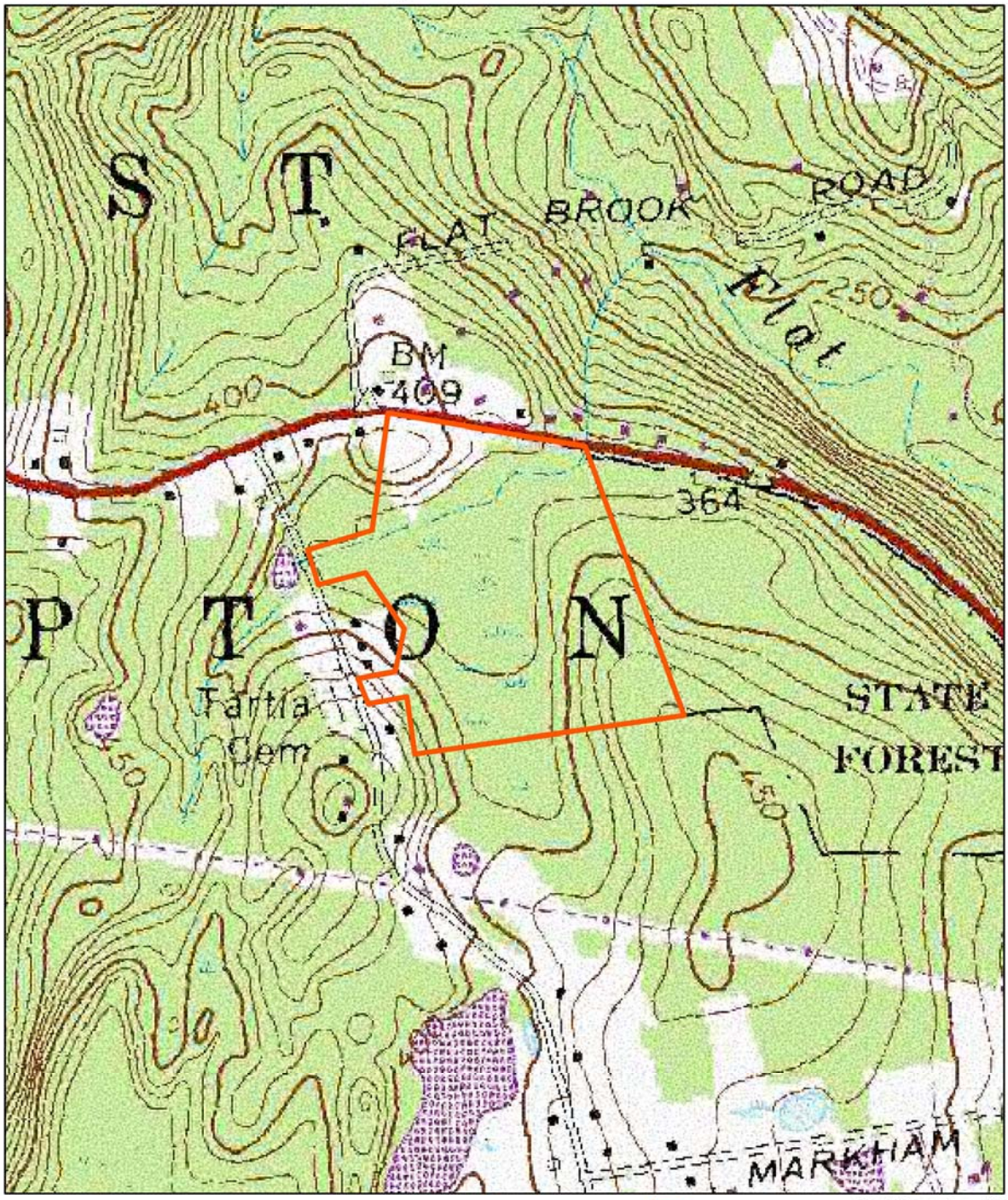
The review process consisted of four phases:

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

The data collection phase involved both literature and field research. The field review was conducted Monday, January 25, 2010. Team members also made individual or multiple 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.

Pelletier Development Subdivision Site Map



Pelletier Development Subdivision 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.
January 2010.

ERT Study Area

0 0.04 0.08 0.16 0.24 Miles

East Hampton, CT

N W E S

TOPOGRAPHY AND GEOLOGY

Summary

Neither the topography nor the geology of the area provide reason to favor either the conventional subdivision or the clustered subdivision plans. If the clustered subdivision plan is approved, perhaps, because the parcel abuts state forest land, the open space could be deeded to the State to ensure that buildable areas on the north side of the parcel are not resubdivided and developed in the future, possibly by a town in need of revenue or a developer who needs funding to maintain the open space.

A question that this reviewer does not have expertise to answer involves the density of water wells in a fractured bedrock aquifer with limited recharge area in the clustered development. Although individual on site systems meet health code separation distances, might the collective water withdrawal by 15 domestic water wells along the crest of the hill draw down the local water table sufficiently to induce septic tank effluent to flow into any individual well's cone of depression?

Observations

The ~42 acre parcel is occupied by a large wetland area that is flanked both to the west and east by gently to moderately sloped hills (Figure 1). The reviewed subdivision proposes to cluster 15 houses on lots of less than an acre in size along the crest of the eastern most hill (Figure 2A). That hill gently rises southward from State Highway 16 (Colchester Avenue) at an elevation of ~374' to about 440', a rise of 66'over a distance of ~1300'. The maximum elevation of the hilltop south of the parcel is just greater than 450'. The minimum elevation in the wetland is just less than 370'.

Bedrock (ledge) in the area is covered by a mantle of thick till (Stone and others, 2005) and does not crop out on the eastern part of the parcel that was observed. Only three test borings (6-7' deep) encountered rock. These that did encounter rock could not determine whether ledge or a large boulder was encountered. Normally, thick till is greater than 15' in thickness and contains a compact basal layer. Test borings did not penetrate a compact layer. The till contains a number of cobbles and small boulders some of which can be seen on the surface. Most of the surface boulders are composed of pegmatite and granitic gneiss (Monson Gneiss, which crops out north and west of the parcel). Only a few are composed of calcsilicate gneiss (Hebron Formation, which underlies the parcel).

The moderate slope at the base of the eastern hill (and possibly the on the other side of the wetland at the base of the western hill) is anomalous in that the transition to gentler slopes both at the top and bottom are abrupt (Figure 2B, C). In some locations, a slight but perceptible rise in topography is found between the base of the moderately steep slope and the wider expanse of the wetland (Figure 2D), suggesting that the location was a former stream channel. The present wetland stream flows at a level several feet lower than the former channel (Figure 3A), suggesting that the former channel predates the

current drainage. It is curious that the moderately steep slope continues southward into the bight just north (fat arrow in Figure 1) of Jacobsen Farm Road. The bight has a morphology similar to that formed by erosion of a stream or river meander into the margin of a flood plain. A possible explanation for these two observations is that they were formed by erosion of a melt-water stream. If that is the case, at least 15' of till was removed, substantiating the interpretation of Stone and others, 2005.

The present wetland drainage was enhanced by trenching more than 60 years ago, judging from the age of trees growing on the spoil banks. This caused incision of the modern channel within the wetland by a couple of feet (Figure 3B).

Stone and others, 2005, infer an ice margin crossed the parcel during the melting of the Ice Age glaciers. The effect of that would be an increase in stoniness in the vicinity of the ice margin (think recessional moraine). Interestingly, an abundance of cobbles and boulders that were encountered on proposed lots 5, 6 and 10 could be interpreted as being the deposits left at the ice margin, approximating a recessional moraine. The abundance of boulders is not concentrated enough to be evidence by itself for that interpretation, but their presence does lend support for the interpretation of Stone and others, 2005, based on data from nearby sites.

Reference

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

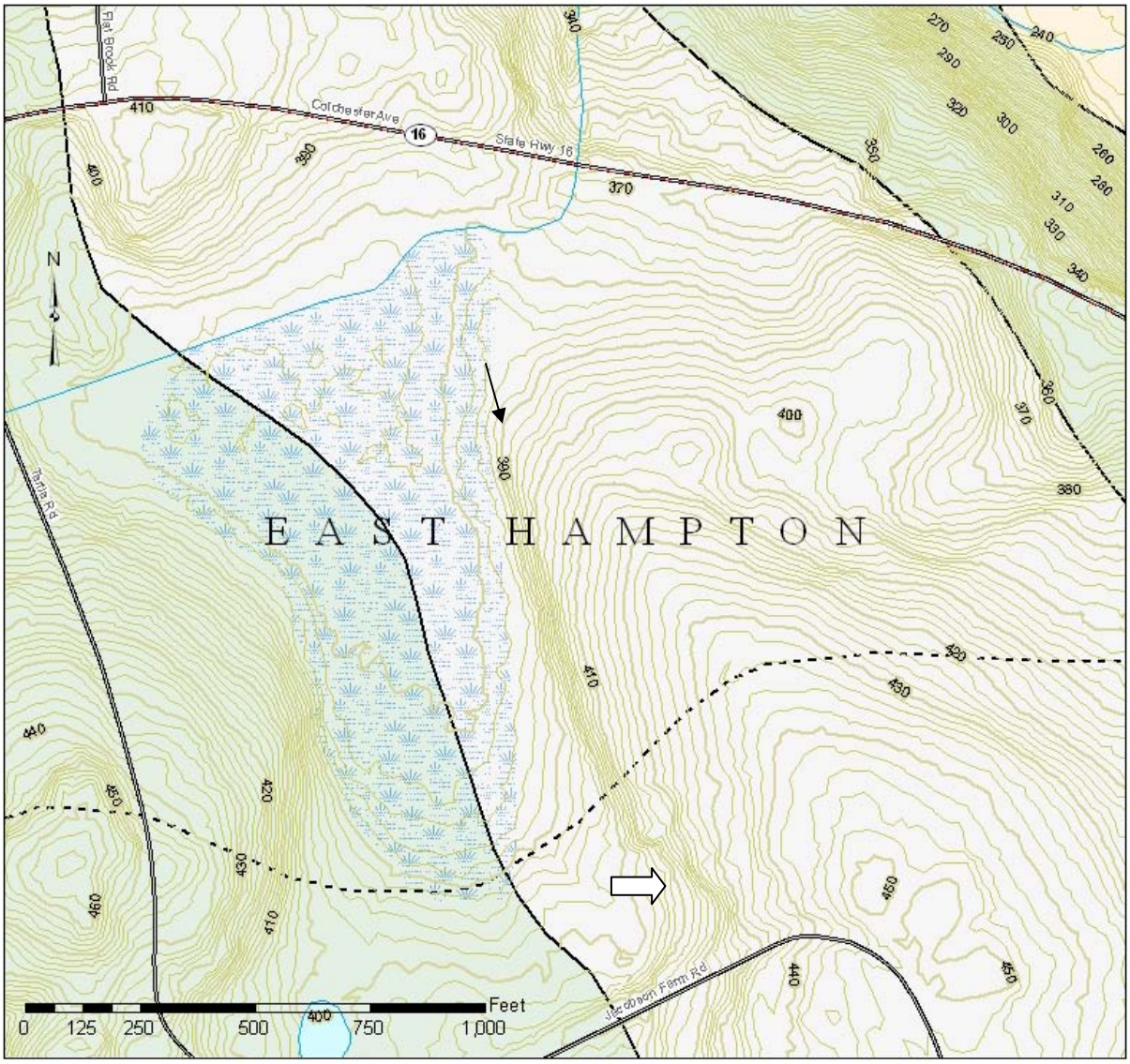


Figure 1. Topography and Quaternary Geology of area to be developed. Wetland (elevation 370-380') occupies a bedrock basin between two glacially sculpted hills (elev. ~450'). Relief is approximately 75'. The proposed development is along the north sloping crest of the eastern-most hill. That hill is elongate in a north-northwest/south-southeast direction and has a rather smooth contour, cut by two bights. One bight (fat white arrow) is just north of Jacobsen Farm Road and on the west slope of the hill; the other is on the northeast slope of the hill. Skinny arrow points to the steep slope at the base of west facing hill. Area of darker green on the map has a thin till mantle; lighter greenish-gray area has a thick till mantle. Dashed line crossing the area is an inferred ice margin ~16,500 radiocarbon years ago during the melting of the last Ice Age glacier. (Quaternary geology after Stone and others, 2005).

A.

B.

C.

D.

Figure 2. A. Crest of hill on which subdivision is proposed, looking south in vicinity of proposed lot 12. B. Looking west at top of steep west-southwest facing slope in vicinity of lot 9. Wetland is beyond in the trees. C. Looking north at steep slope. Note steeper escarpment, here 3-4' in height, at base of slope on west side of hill in vicinity of the rear line of lot 9 or 10. Escarpment here has a slight scalloped edge suggesting stream channel erosion. D. Center of inferred melt-water channel on east side of wetland area west of the rear line of lot 13 or 14. Looking north: steep slope is to right. Moderate rain fell during this field observation and white dots, seen in this and other pictures, are made from the camera-flash reflecting off the backs of rain drops

A. **B.**

Figure 3. A. Melt-water stream terrace (right) drops off a couple of feet to the flood-plain level of the modern wet-land drainage prior to trenching. B. Current level of modern stream, incised perhaps a foot as a result of trenching further downstream.

CONSERVATION DISTRICT REVIEW

District Staff inspected the site with the Environmental Review Team on January 25, 2010. Team members were provided with updated plans on the day of the site visit, entitled "Chatham Forest, Colchester Avenue (Route 16), East Hampton, Connecticut," dated January 25, 2010, prepared by Dutton Associates, Inc. The revised plans depict the proposed conservation subdivision layout, which the applicant has chosen to pursue. Therefore, the following review is in reference to the preferred, conservation subdivision layout, which includes 31.13 acres of open space. Based on the presentation by the applicants, the conservation subdivision offers several obvious advantages over the conventional subdivision in that it concentrates infrastructure and development impacts to a smaller footprint, provides greater open space benefits, and allows for the preservation of significant resources, including the large central wetland.

The ERT was requested to address the merits of a conservation subdivision compared to a conventional subdivision and to address concerns regarding sensitive resources on the site. Of the issues described in the ERT request, the following review focuses on protection of on-site wetlands as well as Flat Brook and its watershed through an analysis of erosion and sediment control and stormwater management.

Wetlands

A large wetland area encompasses much of the central and western portions of the property. A perennial stream runs along the northern edge of the wetland, and crosses below Route 16 within a culvert, located at the northeastern corner of the property. An extensive network of drainage ditches exists within the wetland, presumably dug to drain the wetland for past agricultural use. In the conservation subdivision layout plan, most of the wetland is contained within the proposed open space, with the exception of small areas which extend into a few of the proposed house lots. According to the East Hampton Inland Wetland and Watercourse Regulations, regulated areas include wetlands and watercourses, as well as their associated upland review areas within 100 feet from a wetland or watercourse, or within 150 feet from the Salmon and Connecticut Rivers. No construction is currently proposed within wetlands or their associated upland review areas, with the exception of a stormwater treatment system and outlet, discharging to the perennial stream at the northeastern corner of the property. The proposed road and 15 house lots are to be located along the eastern edge of the property, within the upland.

Soils

The large wetland area is primarily made up of Catden and Freetown soils. These soils are very poorly drained wetland soils, occurring within depressions, with very high available water capacity. The proposed road and house lots would be situated amongst various soils, including: Canton and Charlton Soils, 3-15%, extremely stony; Paxton and Montauk (fine sandy loam as well as sandy loam), 8-15%, very stony; and Woodbridge fine sandy loam, 2-8%, very stony. Proposed or recommended stormwater management

measures would likely be located within the Woodbridge soil, based on location along the back of house lots on the western side of the proposed road, as well as within the northeast corner of the site. There is also an area of Canton and Charlton soils adjacent to the brook. However, these soils have several limitations for stormwater measures. This area of the site is significant, situated at the beginning of the proposed road and adjacent to the stream crossing at Colchester Avenue. Its location and lack of slope are two attributes that make it a good area for stormwater treatment.

Certain soil characteristics can either facilitate or hinder the functionality of particular stormwater measures. According to the CT NRCS document, "Soil Based Recommendations for Storm Water Management Practices," all of the soils in the proposed on-site development areas are appropriate for stormwater basins, while none of these soils are conducive to infiltration practices. Infiltration is impeded in each of these soils due to slope and limited permeability, as well limited depth to restrictive layer and water table in the Woodbridge soil and Paxton and Montauk soils. Of these soils, only the Woodbridge is considered "somewhat limited" as opposed to "most limited" in terms of feasibility for perennial and intermittent wetland systems for stormwater management. Its limitations are slope and seepage, whereas the other soils are limited by water quantity. Woodbridge soils are therefore the most suitable soils on-site for wetland systems, and are also appropriate for stormwater basins. Implementing infiltration practices would require significant design and site modifications.

Erosion and Sediment Control

An erosion and sedimentation control plan for road construction is provided on sheet 11 of the above-mentioned project plans. "Sediment Barriers" are depicted as the primary mode of erosion and sediment control, cutting across the proposed road in 4 locations. If placed across the proposed road as depicted on project plans, typical sediment barriers, including geotextile silt fence and hay bales, would need to be removed to allow for access during road construction. While this measure is adequate for sediment control, it is impractical, as it requires nearly constant relocation and maintenance. The District recommends a method of erosion and sediment control that can remain in place while allowing access on the road during construction. Temporary diversions may be used to direct runoff from the road into sediment basins or roadside ditches with protected outlets within the adjacent upland. While sediment basins are not currently proposed on the erosion and sedimentation control plan, they are required for compliance with the Stormwater Associated with Construction Activities General Permit. Diversions should be designed for consistency with chapter 5, section 7 of the 2002 Connecticut Guidelines for Erosion and Sediment Control.

The erosion and sedimentation control plan specifically addresses road and drainage construction, and does not identify control measures for individual house lots. It is assumed that erosion control plans for each lot will be submitted to the town when each lot is developed.

Stormwater Management

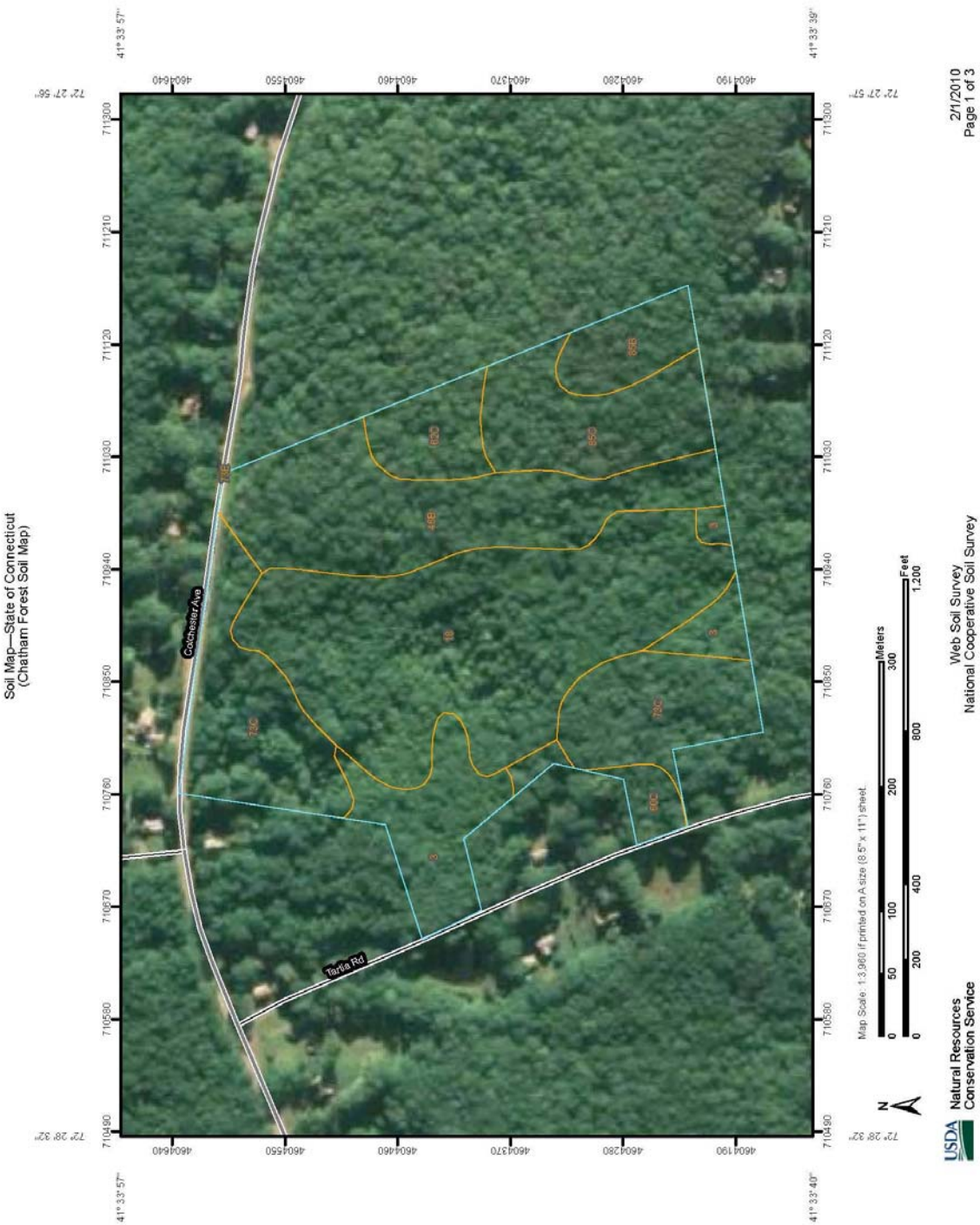
The current site plan depicts catch basins connected along each side of the road, discharging directly to the perennial stream just before it runs beneath Route 16 within a culvert. The plans depict a hydrodynamic separator as a "water quality system" to treat the stormwater before it enters the stream. While hydrodynamic separators are typically acceptable for stormwater quality treatment, they require maintenance and only "treat" suspended solids. Stormwater contains other pollutants which are not treated by hydrodynamic separators. The site is suitable for other stormwater treatment methods, as discussed below.

The District recommends three potential alternatives to the proposed stormwater management system. This site is conducive to various applications of low impact development (LID) methods, in which pre-development hydrology is preserved as much as possible, stormwater is treated more locally, and infiltration is encouraged. The first alternative most closely follows the LID approach, by eliminating roadside curbs, catch basins, and the remainder of the drainage system, replacing it with grass-lined swales along the road and between house lots on the west side of the road. The swales would have to be carried past each of the septic systems toward the base of the slope. As with all of the proposed alternatives, assessment of existing and proposed hydrological conditions would have to be completed to determine feasibility. However, there appears to be ample space between the proposed houses and a lot of upland area to accommodate additional drainage. Dispersing flows within the upland and eventual flow through the wetland would allow for additional water quality treatment.

A second option, which may be more easily adopted if curbs are preferred, is to construct curbs and catch basins, and disperse the discharges throughout the subdivision with a more traditional drainage system. Similar to alternative described above, culverts could be used to carry flow between the houses, and down the slope. The culverts would daylight at the rear of the house lots, allowing stormwater to disburse gradually into the wetland. Both the first and second options provide improved water quality treatment, and avoid a direct impact to the perennial stream.

A third option would utilize more traditional stormwater quality measures within the large flat upland area adjacent to the stream in the northeast section of the property. This approach would maintain the proposed curbs, catch basins, and stormwater pipes, yet would contain additional stormwater quality measures. Rather than the one-component water quality system (hydrodynamic separator) currently proposed, an improved traditional approach would be to incorporate additional stormwater quality measures into a treatment train before discharging to the stream. The District recommends a treatment train of at least two or three stormwater quality measures, which may include a hydrodynamic separator followed by a stormwater treatment basin or wetland, followed by a vegetated swale, or other filtering or storage practice, as described in the 2004 Connecticut Stormwater Quality Manual. Stormwater would still be discharged to the perennial stream, yet would receive greater water quality treatment.

Additional LID or traditional stormwater treatment practices not identified in this review may also be applicable to this site, and may provide more effective water quality enhancement than what is currently being proposed. (Please see Stormwater Management section.) Using an alternative and/or more comprehensive stormwater quality approach, along with improved erosion and sediment control measures, will benefit on-site wetlands and watercourses as well as Flat Brook and its watershed, of which the site is a part.


Soil Map—State of Connecticut
(Chatham Forest Soil Map)
Colchester Ave
Tarifa Rd
Map Scale: 1:3,960 if printed on A size (8.5" x 11") sheet.
Meters
Feet
Web Soil Survey
National Cooperative Soil Survey
Natural Resources
Conservation Service
2/1/2010
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MAP LEGEND

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

Soils
- Soil Map Units

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

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

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

MAP INFORMATION

Map Scale: 1:3,960 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 7, Dec 3, 2009

Date(s) aerial images were photographed: 8/16/2006

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

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, extremely stony	3.5	9.6%
18	Catden and Freetown soils	12.0	32.9%
46B	Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	6.7	18.3%
60C	Canton and Charlton soils, 8 to 15 percent slopes	0.8	2.3%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	1.6	4.3%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	6.9	18.8%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	0.0	0.0%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	1.5	4.1%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	3.5	9.6%
Totals for Area of Interest		**36.4**	**100.0%**

STORMWATER MANAGEMENT

Runoff from construction and post-construction activities has the potential to pollute wetlands and watercourses downstream of stormwater discharge locations. During the period of construction, the discharge of sediment, particularly during significant storm events, could occur even when non-structural and structural erosion and sediment controls are installed. Post construction, the increase in the quantity and peak flow of stormwater runoff, could contribute to downstream flooding and erosion problems. Additionally, the quality of stormwater runoff (post construction) could be degraded by the presence of pollutants such as total suspended solids, nutrients, and pesticides.

In order to minimize the pollution potential from stormwater, the following is a list of recommended management measures:

- Establish setback or buffer areas (50 feet, minimally, to 100 feet, preferably) within upland areas that are adjacent to wetlands or watercourses.
- Promote sheet flow to the maximum extent possible, by eliminating curbs, utilizing pervious pavement, installing vegetative swales, and employing level spreaders.
- Infiltrate stormwater discharges to the maximum extent possible to promote groundwater recharge and lessen the quantity of runoff needing treatment.
- Install structural stormwater management measures to treat stormwater runoff during construction. Such measures include, but are not limited to, earthen dikes/ diversions, sediment traps, check dams, level spreaders, gabions, temporary or permanent sediment basins and structures.
- Prepare a stormwater management plan, which considers both quantity and quality of runoff for the entire development site, rather than piecemeal during development of each lot.

The construction of the Pelletier Development Company Subdivision, ("site") will be regulated by the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities ("the construction general permit"). In accordance with Sections 4(c) and 6(b)(6) of the construction general permit, respectively, a registration form must be filed and a Pollution Control Plan ("PCP") must be prepared and implemented. The following review comments are based upon the requirements of the construction general permit and review of the Overall Conceptual Layout Plans provided on January 25, 2010 for the Environmental Review Team (ERT) site walk. A more detailed review was not possible as the erosion and sediment control plans were not available for review.

Prior to submitting a registration form to the DEP, a review to verify compliance with State and National Historic Preservation statutes, regulation and policies and Endangered and Threatened Species Statutes must be conducted. Please contact the Historic Commission at 860-256-2761 for the historic preservation review. Information on conducting a Natural Diversity Database Review is available online at http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323466&depNav_GID=1628&depNav

=|. If endangered/ threatened species are present in the project area, please contact Dawn McKay of the DEP at 860-424-3592. *(Please also see Natural Diversity Base report sections and Archaeological Historical Review report sections.)* Pursuant to Section 3.(b)(2) of the construction general permit, the project will not be eligible for construction general permit coverage if until compliance with Section 26-306 of the Connecticut General Statutes is achieved.

The owner or developer must register the site with the Department of Environmental Protection ("DEP") thirty days prior to the commencement of construction activity. The Pollution Control Plan ("the PCP") must be prepared and kept on site during the entire life of the construction project for sites with soil disturbance between 5-10 acres. The PCP is required to be submitted to the DEP with the registration form for sites with soil disturbance of 10 or more acres.

The PCP must include a site map as described in Section 6(b)(6)(A) of the construction general permit and a copy of the erosion and sedimentation (E & S) control plan for the site. An E & S plan which has been approved by the Town of East Hampton in conjunction with the DEP Inland Water Resources Division (IWRD) and the local Soil and Water Conservation District may be included in the PCP. The PCP and site map must include specifics on controls that will be used during each phase of construction, pursuant to Section 6(b)(6)(B) of the construction general permit. Specific site maps and controls must be described in the PCP, as well as construction details for each control used. The construction general permit requires that the plan shall ensure and demonstrate compliance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (Guidelines). The Plan must be flexible to account for adjustment of controls as necessary to meet field conditions.

In order to reduce erosion potential, DEP recommends that construction activities be phased to the maximum extent possible so that unstable areas are minimized. The construction general permit also requires that any inactive area left disturbed for over 7 days be temporarily stabilized. Areas left disturbed over 30 days must be temporarily seeded. The PCP must specify a stabilization plan (within and outside of the seeding season) which includes such measures as seeding, applying hay/ mulch, and, for slopes 3:1 and steeper, installing an appropriate grade of erosion control matting, a spray-on "soil cement" type of armor mulch, or a reverse slope bench as required by the Guidelines.

The PCP must demonstrate that the post-construction stormwater treatment system has been designed with a goal of 80% removal of total suspended solids, pursuant to Section 6(b)(6)(C)(iii)(1) of the construction general permit. Post construction stomwater management measures should be designed in a manner consistent with the 2004 CT Stormwater Quality Manual (Manual). Such measures may include, but are not limited to, primary stormwater treatments (such as stormwater wet ponds and stormwater wetlands as identified in the Manual), stormwater detention basins with sediment forebays, stormwater retention basins, swirl concentrator technology structures (such as Vortechnics, Downstream Defender, Stormceptor, Stormtreat, or similar), vegetated

swales, deep catch basin sumps (4'+) and stormwater infiltration devices. The PCP must also discuss the installation of velocity dissipation devices at all discharge locations as a post construction stormwater management measure. A detail of proposed measures must be provided. If site conditions allow, DEP recommends the installation of stormwater treatment ponds as outlined in the Manual because of pollutant renovation, maintenance, cost, and efficiency considerations. The elimination of point sources through the use of level spreaders or curb elimination is also recommended.

The construction general permit (Section 6(b)(6)(D)) requires inspections of all areas at least once every seven calendar days and after every storm of 0.1 inches or greater. The PCP must also allow for the inspector to require additional control measures if the inspection finds them necessary, and should note the qualifications of personnel doing the inspections. Additionally, the PCP must include monthly inspections of stabilized areas for at least three months following stabilization.

The following are comments specific to review of the conceptual layout plan:

- During construction, a sediment trap and/ or a sediment basin with the ability to store 134 cubic yards of water storage per acre drained must be installed for drainage areas greater than 2 acres. For drainage areas where more than 5 acres is disturbed at any time, a sediment basin with an outlet engineered to remove sediment must be installed.
- The DEP strongly recommends a buffer area exist between the detention/ sediment basin and wetlands areas. The presence of a buffer area is of particular importance during construction to prevent the discharge of fine soil particles which are not removed effectively by sedimentation. Should a basin(s) fail due to inadequate design, lack of maintenance, etc., the absence of a buffer area would result in the immediate contamination of the wetland areas with sediment. A discharge of sediment to a wetland or watercourse without a permit would be a violation of Sections 22a-430 and 22a-42a(c)(1) of the Connecticut General Statutes and may require remedial action.

In order to reduce the impact of development and address stormwater quality issues, the Department strongly encourages the use of Low Impact Development (LID) measures. LID is a site design strategy intended to maintain or replicate predevelopment hydrology through the use of small-scale controls integrated throughout the site to manage stormwater runoff as close to its source as possible. Infiltration of stormwater through LID helps to remove sediments, nutrients, heavy metals, and other types of pollutants from runoff.

Key strategies for effective LID include: infiltrating, filtering, and storing as much stormwater as feasible, managing stormwater close to where the rain/snow falls, managing stormwater at multiple locations throughout the landscape, conserving and restoring natural vegetation and soils, preserving open space and minimizing land disturbance, designing the site to minimize impervious surfaces, and providing for maintenance and education. Water quality and quantity benefits are maximized when

multiple techniques are grouped together. In areas of compacted and/or possibly contaminated soils, soil suitability should be further investigated prior to selecting optimum treatment and/or remediation measures. Where soil conditions permit, we typically recommend the utilization of one, or a combination of, the following measures, some of which have been touched on previously:

- the use of pervious pavement or grid pavers (which are very compatible for parking lot and fire lane applications), or impervious pavement without curbs or with notched curbs to direct runoff to properly designed and installed infiltration areas;
- the use of vegetated swales, tree box filters, and/or infiltration islands to infiltrate and treat stormwater runoff (from building roofs, roads, and parking lots);
- the minimization of access road widths and parking lot areas to the maximum extent possible to reduce the area of impervious surface;
- the use of dry wells to manage runoff from building roofs;
- incorporation of proper physical barriers or operational procedures for special activity areas where pollutants could potentially be released (e.g. loading docks, maintenance and service areas, dumpsters, etc.);
- the installation of rainwater harvesting systems to capture stormwater from building roofs for the purpose of reuse for irrigation (i.e. - rain barrels for residential use and cisterns for larger developments);
- the use of residential rain gardens to manage runoff from roofs and driveways;
- providing for pollution prevention measures to reduce the introduction of pollutants to the environment.

Contact Jessica Morgan, the CT DEP LID Coordinator, at 860-418-5994 or jessica.morgan@ct.gov for more information and /or resources on LID site design and stormwater BMPs.

FISHERIES RESOURCES

Fisheries Resources

A small unnamed watercourse, that is tributary to Flat Brook flows through the northern portion of the proposed Chatham Forest Subdivision property emanating from a large forested wetland complex. Subsequently, the watercourse is conveyed via a 36 inch diameter round concrete culvert under Route 16 before emptying into Flat Brook just south of Flat Brook Road. Flat Brook is a tributary of the Salmon River. This watercourse is highly incised on the subdivision property having been channelized and straightened in the past. Mesohabitats are primarily in the form of alternating small cobble/small boulder step-pools. This narrow stream is well shaded with a very tight, closed overhead canopy that helps cool stream water temperatures.

Watercourses such as Flat Brook are generally thought by the public as being too small to support fish; however, fisheries biologists and stream ecologists recognize these watercourses and their habitats as very sensitive and critical to the production and survival of headwater brook trout populations. In addition, they also function to protect and maintain the water quality of recipient waterbodies downstream in the watershed. Electrofishing surveys within Flat Brook conducted by DEP Inland Fisheries Division staff have documented that Flat Brook is a coldwater stream that does support a native brook trout fish population. Brook trout, which are species native to Connecticut, typically spawn during the month of October. Eggs incubate within gravel substrates over the fall and winter periods with eggs hatching in late February or early March. Fry remain in the gravel until their yolk sacs are absorbed at which time the fry emerge from underneath the gravel and move into preferred stream microhabitats. Fry emergence occurs when fish reach about 1.5 inches in length. Flat Brook is also stocked with juvenile (fry stage) Atlantic salmon per management restoration strategies implemented through the Connecticut River Atlantic Salmon Restoration Program.

The unnamed tributary to Flat Brook within the subdivision property has not been sampled by Inland Fisheries Division staff so it is unknown whether or not this watercourse south of Route 16 also supports a native brook trout population. More than likely the stream supports a native brook trout population closest to its confluence within the mainstem of Flat Brook. The existing 36 inch diameter culvert that conveys this watercourse underneath Route 16 creates a barrier to upstream fish passage due to the culvert being perched or elevated above grade. In addition on subdivision property, there is a small boulder dam/wall that spans across this unnamed tributary approximately 40 feet upstream from the edge of the Route 16 embankment. This small dam would also present an impediment to upstream fish passage.

Surface water quality of Flat Brook and its tributary are classified by the Connecticut Department of Environmental Protection as Class A. Designated uses of Class A waters are as follows: potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other purposes.

Potential Resource Impacts

The conservation subdivision design as presented in plans distributed during the field review (dated 1/25/2010) is preferred given that the footprint of the development is limited to a smaller portion of the overall property size, approximately 11 acres, thereby preserving a larger portion, almost 31 acres for open space. Residential development design for the most part has mitigated for most potential impacts to fisheries resources by providing a sufficient undisturbed vegetated riparian buffer zone adjacent to the unnamed tributary to Flat Brook. It is the policy of the Inland Fisheries Division (IFD) that riparian corridors be protected with a 100 ft. wide undisturbed riparian buffer zone. A riparian wetland buffer is one of the most natural mitigation measures to protect the water quality and fisheries resources of watercourses.

This policy and supportive documentation can be viewed on the DEP website at: http://www.ct.gov/dep/lib/dep/fishing/restoration/riparianpolicy.pdf and http://www.ct.gov/dep/lib/dep/fishing/restoration/riparianpositionstatement.pdf.

As with any residential development, there is always a potential for erosion and stream sedimentation to occur during construction because of disturbed soils. The negative impacts of sediment runoff have been well documented by researchers. Sediment will reduce populations of aquatic insects and fish by eliminating physical habitat while suspended sediments will reduce dissolved oxygen levels (Cordone and Kelley 1961). Suspended sediments may prevent successful nest development of trout (Bell 1986). As reported by Meehan (1991), sediment deposition can severely impact spawning substrate abundance and quality. Reductions in egg survival are caused by smothering, insufficient oxygen supply and lack of proper removal of catabolic products (Bell 1986). Meehan (1991) indicated that erosion and sedimentation of instream habitat could alter channel morphology by increasing the stream width-depth ratio, incidence and severity of streambank erosion, channel braiding, and reduce pool volume and frequency.

Recommendations/Comments

The following recommendations and comments are provided to minimize impacts to fisheries resources:

Erosion and Sediment Control Plan

It is recommended to develop an aggressive and effective erosion and sediment control plan that utilizes guidance as described in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (CTDEP 2002). Proper installation and maintenance of erosion/sediment controls is critical to environmental well being. This includes such mitigative measures as filter fabric barrier fences, staked hay bales, and sediment basins. Land disturbance and clearing should be kept to a minimum. Particular attention should be paid to any land clearing adjacent to wetlands associated with the rear portions of Lot numbers 8 through 15. All disturbed areas should be restabilized as soon as possible. Exposed, unvegetated areas should be protected from storm events. The applicant and

the local wetland enforcement officer should be responsible for checking this development on a periodic basis to ensure that all soil erosion and sediment controls are being maintained.

Stormwater Control

Rather than consolidating stormwaters into underground piping and catch basins with ultimate conveyance to a terminal Hancor stormwater quality control unit that discharges stormwaters to the unnamed tributary of Flat Brook, the applicant and town may want to consider the incorporation of Low Impact Development (LID) measures in development design with the goal of minimizing land grading and disturbance. LID measures promote sheet flow over land by eliminating curbs, utilizing pervious pavement, installing and maximizing the use of vegetative swales, increasing and lengthening drainage flow paths and lengthening and flattening slopes.

Lawn Chemicals/Fertilizer

Whenever possible, landowners should minimize use of lawn chemicals and use fertilizers with little or no phosphorus. The use of low or non-phosphorous fertilizers can provide nutrients while avoiding threats to water quality. Property owners should consider having the soil in lawns tested to identify amounts of nitrogen, phosphorus, potassium and lime (pH) required to grow and maintain turfgrass.

Fish Passage Enhancement

As mentioned, within the subdivision property this is a small boulder dam/wall that spans across the unnamed tributary to Flat Brook, located approximately 40 feet upstream from the Route 16 embankment. It is recommended to remove this barrier to ensure unobstructed upstream passage of fish and other aquatic organisms.

Literature Cited

Bell, M.C. 1986. Fisheries handbook of engineering requirements and biological criteria. U.S. Army Corps of Engineers. Fish Passage Development and Evaluation Program. North Pacific Division, Portland, OR. 290 pp.

Cordone, A. J., and D. W. Kelley. 1961. The influences of inorganic sediment on the aquatic life of streams. California Fish and Game 47:189-228.

CTDEP 2002. Connecticut Guidelines for Soil Erosion and Sediment Control Manual (DEP Bulletin 34).

Meehan, W.R. 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19, Bethesda, MD. 751 pp.

THE NATURAL DIVERSITY DATA BASE

The Natural Diversity Data Base maps and files regarding the project area (proposed Pelletier Development Company subdivision along Route 16 and just east of Tartia Road in East Hampton, Connecticut) have been reviewed. According to our information, there are records for State Special Concern *Terrapene Carolina Carolina* (eastern box turtle) from the vicinity of this project site. *(See Appendix for DEP State Species of Special Concern information.)*

Eastern box turtles require old field and deciduous forest habitats, which can include power lines and togged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic, and hibernate on land by digging down in the soil from October to April, They have an extremely small home range and can usually be found in the same area year after year This species is dormant from November 1 to April 1. It has been negatively impacted by the loss of suitable habitat.

If Eastern box turtle habitat is going to be impacted by this proposed project, the Wildlife Division recommends that a herpetologist familiar with the habitat requirements of these species conduct surveys between April and September to see if they are present. A report summarizing the results of such surveys should include habitat descriptions, reptile species list and a statement/resume giving the herpetologist1 qualifications. The DEP doesn't maintain a list of qualified herpetologists. A DEP Wildlife Division permit may be required by the herpetologist to conduct survey work, you should ask if your herpetologist has one. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.
Standard protocols for the protection of wetlands should be followed and maintained during the course of the project. Additionally, all silt fencing should be removed after soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

Please be advised that this section of the Wildlife Division has not made a field inspection of the project nor have we seen detailed timetables for work to be done. Consultation with the Wildlife Division should not be substituted for site-specific surveys that may be required for environmental assessments. The time of year when this work will take place will affect these species if they are present on the site when the work is scheduled. Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested. If the proposed project has not been initiated within 6 months of this review, contact the NDDB for an updated review. If you have any additional questions, please Julie.Victoria@ct.gov; please reference the NDDB #17433.

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

Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

WILDLIFE RESOURCES

Site inspections were conducted on January 25 and February 22, 2010 to evaluate existing wildlife habitat on the property. The property is approximately 42 acres, located in a moderately developed area bordered by Route 16 to the north, residential neighborhoods to the south and west, and a 63-acre parcel of the Salmon River State Forest to the east. The site is primarily wooded. There are approximately 14 acres of wetlands including an unnamed stream and forested wetlands/marshlands. The proposed development is for a 15 lots on 10.7 acres of the property, with approximately 31.3 acres to remain as open space.

Existing Wildlife Habitats

Upland Forested Area

Housing units are proposed for the upland forested areas on the eastern portion of the property. This area contains mature deciduous forest, with an overstory of black birch, oaks, and red maple. Moist forest, dominated by yellow birch and black birch occurs in the marshy areas around the unnamed stream. 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, broad-winged hawk, redback salamander and eastern garter snakes.

Wetlands

Wetlands include an unnamed east-west stream in the northern portion of the property and approximately 14 acres of forested wetlands in the central portion of the property. 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, common yellowthroat 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 to 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 the one 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.

Impacts

Development is to take place on approximately 11 acres of upland, leaving a 0.5 acre parcel of upland in the northeast corner, an approximately 3 acre upland section in the southeast corner, and the adjacent wetland areas as open space. Although the wetlands are not to be developed and therefore will not be directly impacted, there will be significant indirect impacts to many wetland-dependent species and direct impacts to upland species, which include:

- Outright habitat loss at the development site, affecting and changing the species composition of the upland area as lawn and pavement will replace the trees and shrubs that now serve as sources of food, cover and shelter.
- Although the wetland area is not to be developed, there are many wetland-dependent species, such as green frog, that also need adjacent upland to meet their habitat requirements. The adjacent upland habitat will be severely reduced and no longer be available for these species, and there will be no viable alternative, as the property is abutted by either development or major roadways on the other 3 sides.
- Loss of connectivity with Salmon River State Forest. Many species that require extensive areas of upland habitat such as that found in Salmon River State Forest parcel may also utilize the wetland complex found on this parcel. The upland areas adjacent to Salmon River that are to remain as open space are very small, and, given their proximity to the proposed lots/roadways, are not likely to be usable by wildlife as a corridor to the wetland complex.
- Degradation of the wetland area, due to runoff from the developed area, encroachment into the wetland area, and disturbance through human activity.

Reducing Impacts

Currently, housing lots are planned for the upland portion of the property abutting Salmon River State Forest (the eastern portion of the property). With the increased development in this area, the value of the area for wildlife will decrease. The only way to maintain the quality of the available habitat is to leave the property undeveloped. While any type of development will diminish the value of the habitat for wildlife, changes in the layout of the development can reduce these impacts. Moving the development to the portion of the property north of the wetland would keep the higher value portion of the parcel available to wildlife. The area north of the wetland has frontage along Route 16 and is adjacent to already developed areas. This would leave existing upland habitat that is not surrounded by development or road frontage, and there would be no loss of connectivity between Salmon River State Forest and the existing wetland. Another option to reduce impacts is to reduce the size of the development, leaving undeveloped lots 5-10. Although this would still significantly reduce the available upland habitat, it would allow some connectivity with Salmon River State Forest to be retained.

Summary

The proposed project will almost totally replace the existing upland habitat with residential housing, resulting in a direct loss of these habitat types. Development in the forested area will affect the number and composition of species found. While no development is planned for the wetland areas, there are still potential impacts to the reptile and amphibian species that use the wetlands in conjunction with the adjacent uplands. Most reptile and amphibian species are not very mobile and cannot easily seek out suitable habitat elsewhere once disturbance has occurred. The impacts to wildlife should be expected to be significant. Additionally, while recreational hunting is allowed in the abutting portion of Salmon River State Forest, further development, in conjunction with existing structures will limit firearms use due to the restriction on discharging a firearm within 500' of a dwelling.

ARCHAEOLOGICAL AND HISTORICAL REVIEW

The Office of State Archaeology (OSA) and the State Historic Preservation Office (SHPO) note that the proposed project area possesses a moderate-to-high sensitivity for archaeological resources. Areas of sensitivity include well-drained soils, generally level topography adjacent to the wetland basin for pre-Contact Native American camps and the frontage of Route 16 for potential historic period sites. The Conventional and Conservation Subdivision plans may differentially affect these topographic and environmental areas of human settlement.

Conventional Plan

The OSA and SHPO recommend a Phase I archaeological survey for Lots 1, 2, 9, 10, 11, 12 and 13 which have the highest sensitivity for cultural resources. **(Plans dated 11-23-2009.)**

Conservation Plan

Due to the elimination of lots fronting Route 16, this subdivision plan would necessitate an archaeological survey for Lots 15, 16 and, the proposed Detention Pond area. **(Plans date 11-23-2009.)**

The OSA and SHPO are available to provide technical assistance to Pelletier Development Company and the Town of East Hampton in fulfilling their recommendations. All archaeological surveys should be conducted in accordance with the State Historic Preservation Office's *Environmental Review Primer for Connecticut's Archaeological Resources*.

Should you have any questions regarding this review please contact Dr. Nicholas Bellantoni at 860-486-5248.

APPENDIX

DEP – State Species of Special Concern Information
Eastern Box Turtle

Connecticut Department of Environmental Protection

Eastern Box Turtle

Terrapene carolina carolina

State Species of Special Concern

Description
The eastern box turtle is probably the most familiar of the 8 species of turtles found in Connecticut's landscape. It is known for its high-domed carapace (top shell). The carapace has irregular yellow or orange blotches on a brown to black background that mimic sunlight dappling on the forest floor. The plastron (under shell) may be brown or black and may have an irregular pattern of cream or yellow. The length of the carapace usually ranges from 4.5 to 6.5 inches, but can measure up to 8 inches long. The shell is made up of a combination of scales and bones, and it includes the ribs and much of the backbone.

Each individual turtle has distinctive head markings. Males usually have red eyes and a concave plastron, while females have brown eyes and a flat plastron. Box turtles also have a horny beak, stout limbs, and feet that are webbed at the base. This turtle gets its name from its ability to completely withdraw into its shell, closing itself in with a hinged plastron. Box turtles are the only Connecticut turtle with this ability.

Range
Eastern box turtles are found throughout Connecticut, except at the highest elevations. They range from southeastern Maine to southeastern New York, west to central Illinois, and south to northern Florida.

Habitat and Diet
In Connecticut, this terrestrial turtle inhabits a variety of habitats, including woodlands, field edges, thickets, marshes, bogs, and stream banks. Typically, however, box turtles are found in well-drained forest bottomlands and open deciduous forests. They will use wetland areas at various times during the season. During the hottest part of a summer day, they will wander to find springs and seepages where they can burrow into the moist soil. Activity is restricted to mornings and evenings during summer, with little to no nighttime activity, except for egg-laying females. Box turtles have a limited home range where they spend their entire life, ranging from 0.5 to 10 acres (usually less than 2 acres).

Box turtles are omnivorous and will feed on a variety of food items, including earthworms, slugs, snails, insects, frogs, toads, small snakes, carrion, leaves, grass, berries, fruits, and fungi.

Life History
From October to April, box turtles hibernate by burrowing into loose soil, decaying vegetation, and mud. They tend to hibernate in woodlands, on the edge of woodlands, and sometimes near closed canopy wetlands in the forest. Box turtles may return to the same place to hibernate year after year. As soon as they come out of hibernation, box turtles begin feeding and searching for mates.

The breeding season begins in April and may continue through fall. Box turtles usually do not breed until they are about 10 years old. This late maturity is a result of their long lifespan, which can range up to 50 to even over 100 years of age. The females do not have to mate every year to lay eggs as they can store sperm for up to 4 years. In mid-May to late June, the females will travel from a few feet to more than a mile within their home range to find a location to dig a nest and lay their eggs. The 3 to 8 eggs are covered with dirt and left to be warmed by the sun. During this vulnerable time, skunks, foxes, snakes, crows, and raccoons often raid nests. Sometimes, entire nests are destroyed. If the eggs survive, they will hatch in late summer to early fall (about 2 months after being laid). If they hatch in the fall, the young turtles may spend the winter in the nest and come out the following spring.

As soon as the young turtles hatch, they are on their own and receive no care from the adults. This is a dangerous time for young box turtles because they do not develop the hinge for closing into their shell until they are about 4 to 5 years old. Until then, they cannot entirely retreat into their shells. Raccoons, skunks, foxes, dogs, and some birds will prey on young turtles.

Conservation Concerns
The eastern box turtle was once common throughout the state, mostly in the central Connecticut lowlands. However, its distribution is now spotty, although where found, turtles may be locally abundant. Because of the population decline in Connecticut, the box turtle was added to the state's List of Endangered, Threatened, and Special Concern Species when it was revised in 1998. It is currently listed as a species of special concern. The box turtle also is protected from international trade by the 1994 CITES treaty. It is of conservation concern in all the states where it occurs at its northeastern range limit, which includes southern New England and southeastern New York.

Many states have laws that protect box turtles and prohibit their collection. In Connecticut, eastern box turtles cannot be collected from the wild (DEP regulations 26-66-14A). Another regulation (DEP regulations 26-55-3D) "grandfathers" those who have a box turtle collected before 1998. This regulation limits possession to a single turtle collected before 1998. These regulations provide some protection for the turtles, but not enough to combat some of the even bigger threats these animals face. The main threats in Connecticut (and other states) are loss and fragmentation of habitat due to deforestation and spreading suburban development; vehicle strikes on the busy roads that bisect the landscape; and indiscriminate (and now illegal) collection of individuals for pets.

Loss of habitat is probably the greatest threat to turtles. Some turtles may be killed directly by construction activities, but many more are lost when important habitat areas for shelter, feeding, hibernation, or nesting are destroyed. As remaining habitat is fragmented into smaller pieces, turtle populations can become small and isolated.

Adult box turtles are relatively free from predators due to their unique shells. The shell of a box turtle is extremely hard. However, the shell is not hard enough to survive being run over by a vehicle. Roads bisecting turtle habitat can seriously deplete the local population. Most vehicle fatalities are pregnant females searching for a nest site.

How You Can Help

- Leave turtles in the wild. They should never be kept as pets. Whether collected singly or for the pet trade, turtles that are removed from the wild are no longer able to be a reproducing member of a population. Every turtle removed reduces the ability of the population to maintain itself.
- Never release a captive turtle into the wild. It probably would not survive, may not be native to the area, and could introduce diseases to wild populations.
- Do not disturb turtles nesting in yards or gardens.
- As you drive, watch out for turtles crossing the road. Turtles found crossing roads in June and July are often pregnant females and they should be helped on their way and not collected. Without creating a traffic hazard or compromising safety, drivers are encouraged to avoid running over turtles that are crossing roads. Also, still keeping safety precautions in mind, you may elect to pick up turtles from the road and move them onto the side they are headed. Never relocate a turtle to another area that is far from where you found it.
- Learn more about turtles and their conservation concerns. Spread the word to others on how they can help Connecticut's box turtle population.

The production of this Endangered and Threatened Species Fact Sheet Series is made possible by donations to the Endangered Species-Wildlife Income Tax Checkoff Fund.
(5/08)

ABOUT THE TEAM

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

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

Purpose of the Team

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

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

Requesting a Review

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

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