Kimball Woods Subdivision

Concept Plan for Remainder of Parcel

Chaplin, Connecticut

Eastern Connecticut
Environmental Review Team Report

Eastern Connecticut
Resource Conservation and Development Area, Inc.

Kimball Woods Subdivision
Chaplin, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team

Of the

Eastern Connecticut
Resource Conservation & Development Area, Inc.

For the

Planning and Zoning Commission
Chaplin, Connecticut

July 2008

Report #617

Acknowledgments

This report is an outgrowth of a request from the Chaplin Planning and Zoning Commission to the Eastern Conservation District (ECD) 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 Wednesday, October 24, 2007.

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I would also like to thank Bruce Raymond and John Mayer, Chaplin Planning and Zoning Commission, Joe Randazzo, landowner and applicant, Sean Merrigan, CT DPH-Environmental Engineering, Jeffrey Catlett, Eastern Highlands Health District and Karen Allen, DEP-Stormwater 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 plans and additional information. 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 landowner/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 the remaining phases of the Kimball Woods Subdivision.

If you require additional information please contact:

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Introduction

Introduction

The Chaplin Planning and Zoning Commission has requested Environmental Review Team (ERT) assistance in reviewing the concept plan for the remaining acreage in the Kimball Woods Subdivision.

The total project site is 215.813 acres located on the northwest side of Parish Hill Road across from the high school (the land remaining to be developed is approximately +160 acres). The northern boundary abuts the "Airline Trail", a state designated greenway. The site was recently logged in 2006 and contains several wetland areas and corridors that are to be included in the open space. A Phase I (5 Lots) was approved in 1995 and Phase II (14 Lots on 42.38 acres) was approved with conditions subsequent to the completion of this ERT report. (Please see Appendix for the minutes of the Chaplin Planning and Zoning Commission minutes dated 10/24/07) Phase II and the remainder of the parcel are coming in under recently adopted subdivision regulations with required open space/cluster provisions. A composite plan and the plans for Phase II were available for Team members to review. The total build out could include +73 lots and a loop road system crossing the wetlands with three (3) cul-de-sacs. All the lots will be served by on-site wells and on-site subsurface sewage disposal systems.

Objectives of the ERT Study

The Chaplin Planning and Zoning Commission is requesting an ERT for this site because the project is a large subdivision for the town. They are interested in a natural resource inventory and a review of the concept plan. The PZC would like professional assistance in analyzing the entire site particularly in regard to the adjacent state greenway. Specific concerns include: soils, erosion and sediment control, stormwater management, water quality, open space, wetlands, natural diversity data base species, wildlife corridors, and traffic and access. The ERT study will help guide the town's decision.

The ERT Process

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

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

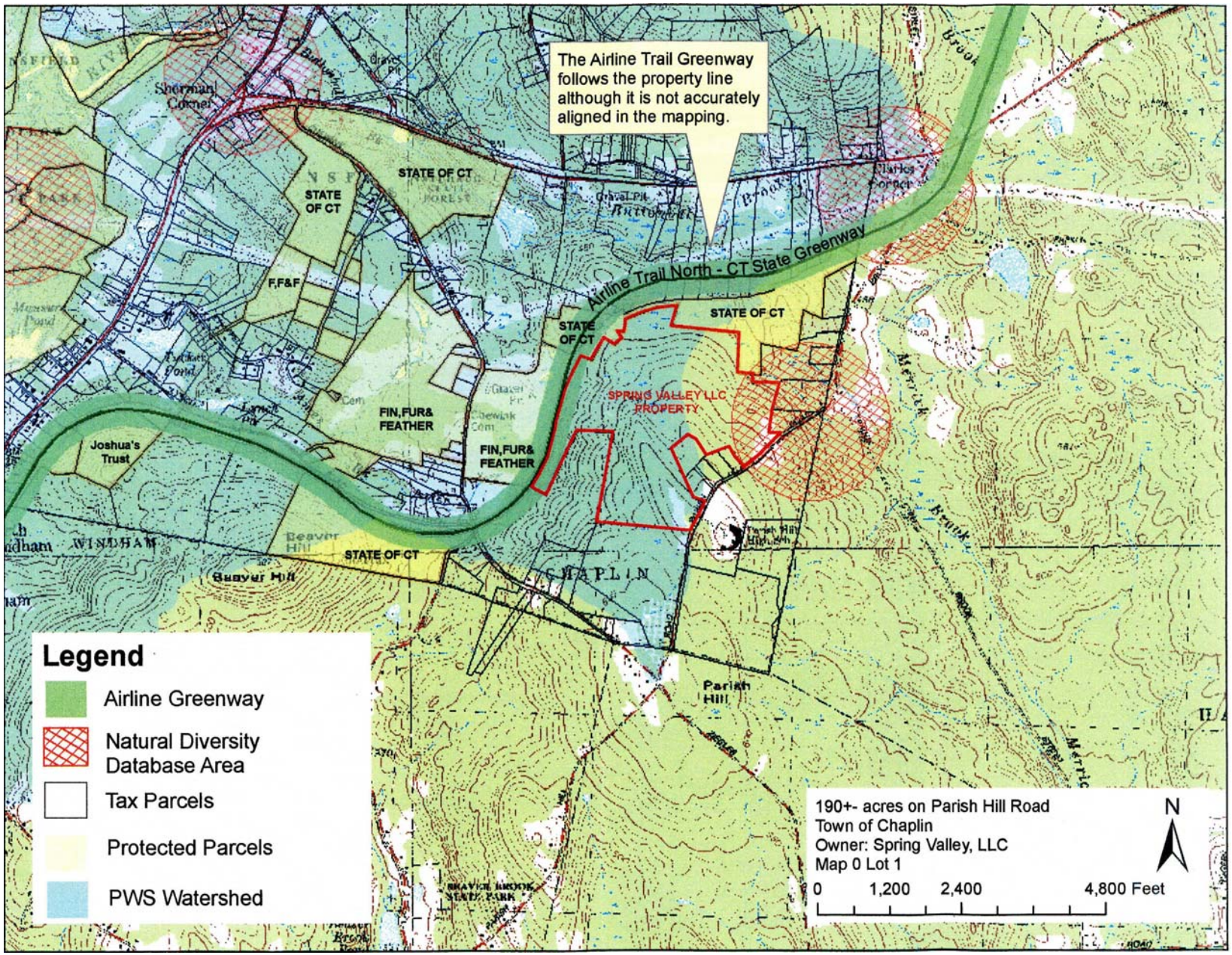
The review process consisted of four phases:

1. Inventory of the site's natural resources;

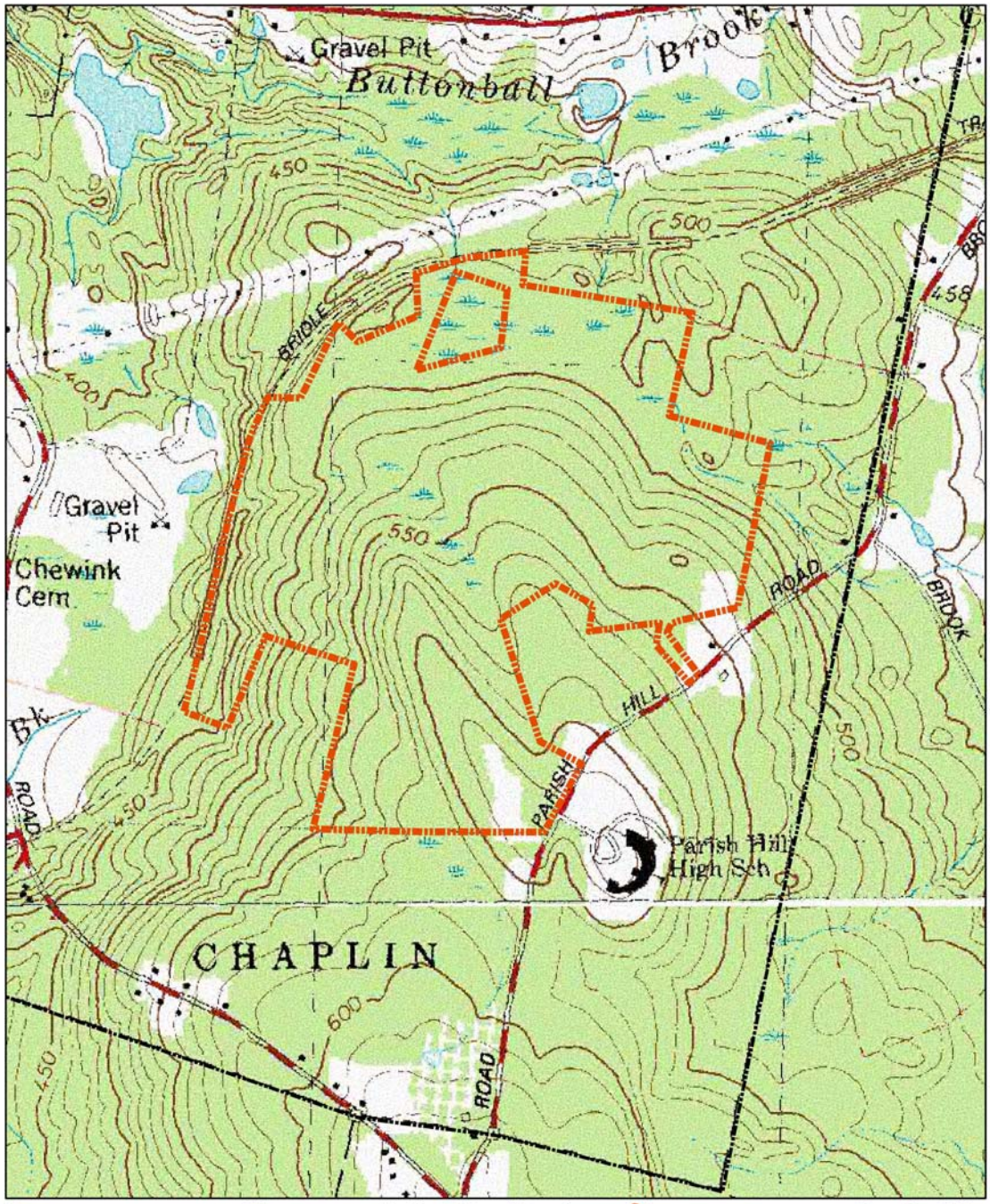
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted Wednesday, October 24, 2007. 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. Some Team members made separate or multiple field trips to the site.

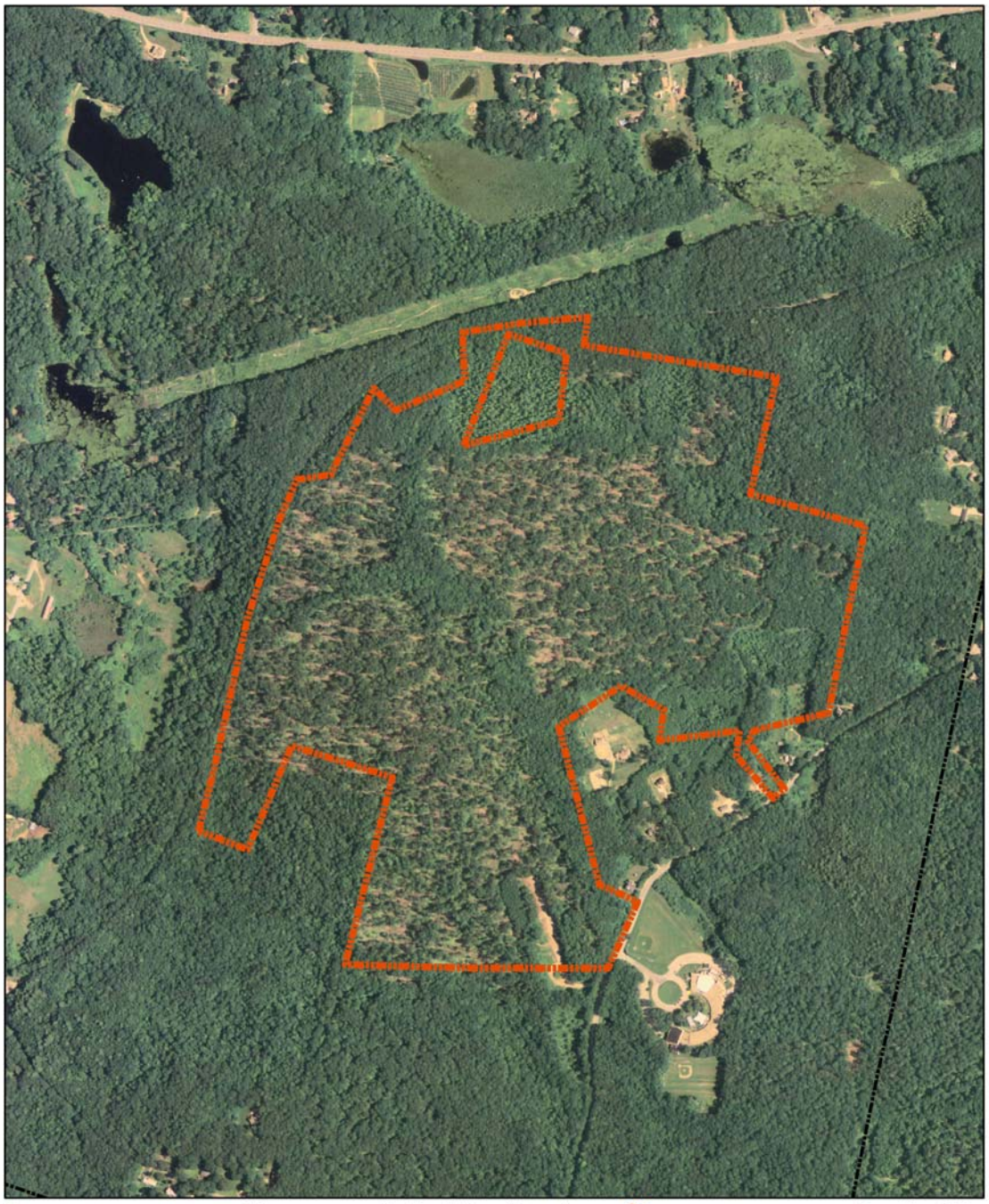
Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.


The Airline Trail Greenway follows the property line although it is not accurately aligned in the mapping.
Airline Trail North - CT State Greenway
STATE OF CT
STATE OF CT
STATE OF CT
STATE OF CT
STATE OF CT
F,F&F
FIN,FUR& FEATHER
FIN,FUR& FEATHER
SPRING VALLEY LLC PROPERTY
Joshua's Trust
Sherman Corner
Beaver Hill
Parish Hill
WINDHAM
CHAPLIN
Legend
Airline Greenway
Natural Diversity Database Area
Tax Parcels
Protected Parcels
PWS Watershed
190+- acres on Parish Hill Road
Town of Chaplin
Owner: Spring Valley, LLC
Map 0 Lot 1
N
0
1,200
2,400
4,800 Feet

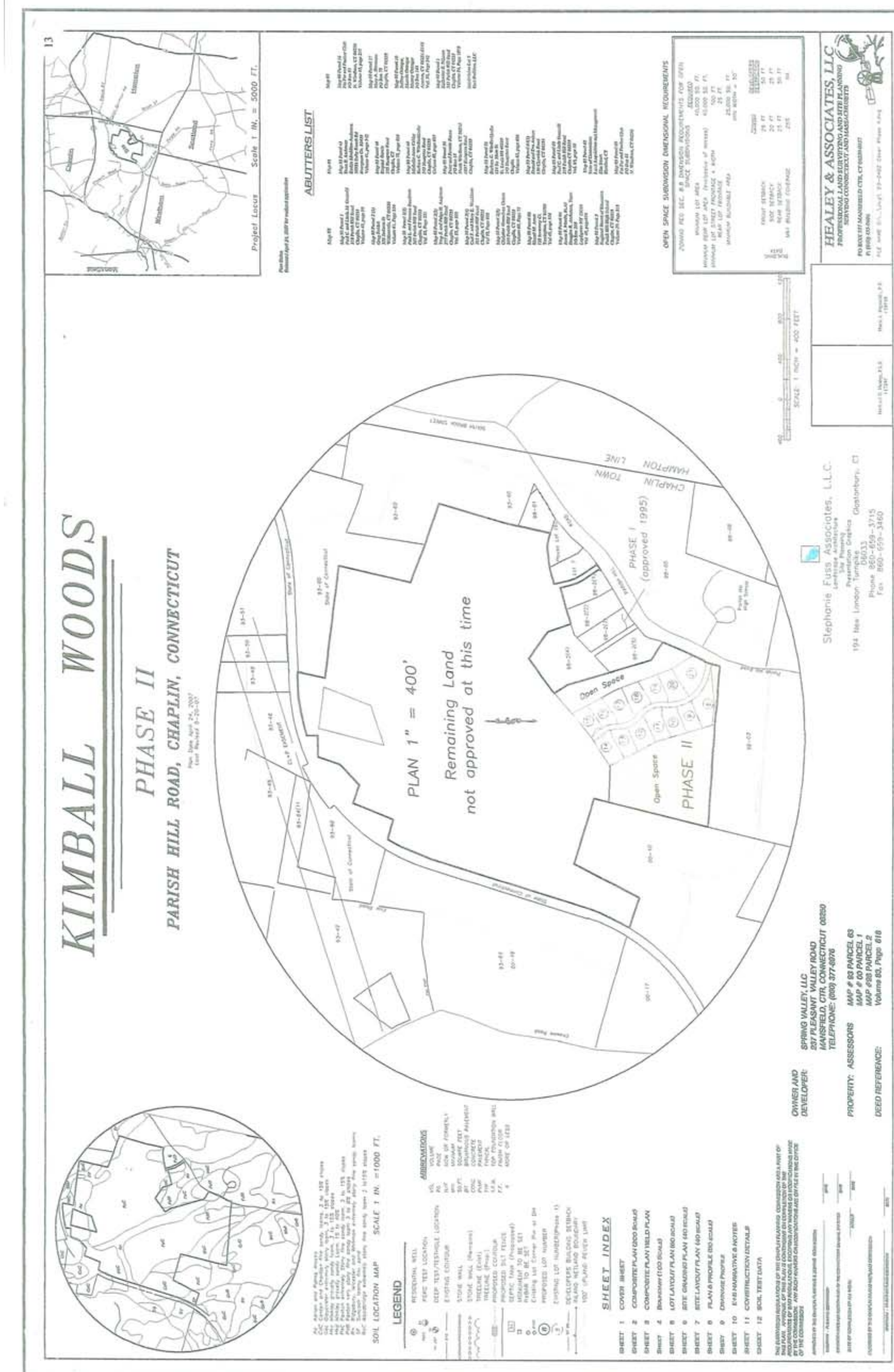
Kimball Woods Subdivision Site Map

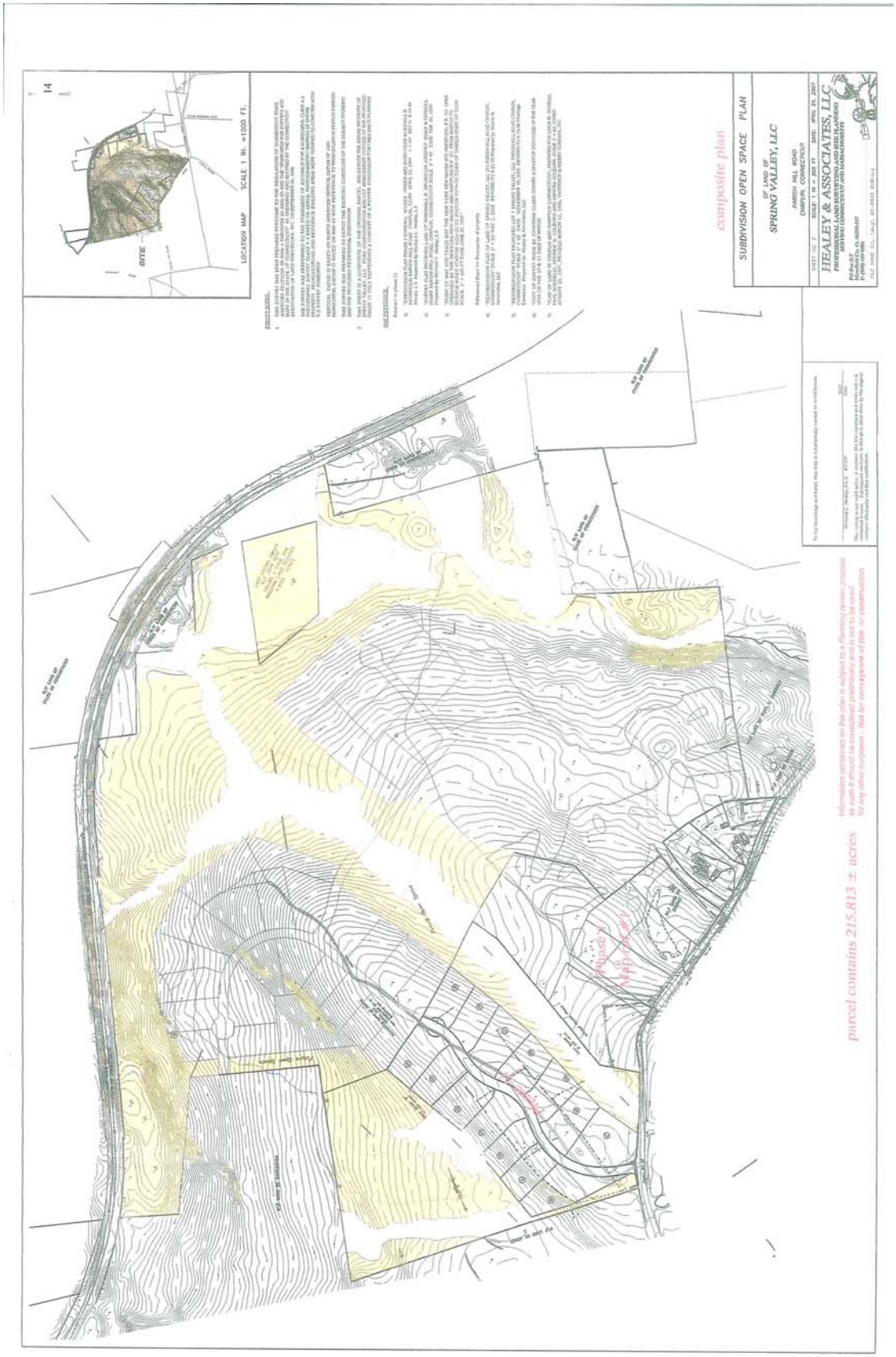


Kimball Woods Subdivision Color Aerial Map



Kimball Woods Subdivision Aerial Map


KIMBALL WOODS
PHASE II
PARISH HILL ROAD, CHAPLIN, CONNECTICUT
PLAN 1" = 400'
Remaining Land
not approved at this time
PHASE I
(approved 1995)
PHASE II
Open Space
CHAPLIN TOWN
HAMPTON LINE
LEGEND
SOIL LOCATION MAP
SHEET INDEX
ABBREVIATIONS
ABUTTERS LIST
Project Locus
OWNER AND DEVELOPER:
SPRING VALLEY, LLC
PROPERTY: ASSESSORS
DEED REFERENCE:
Stephanie Fuss Associates, L.L.C.
HEALEY & ASSOCIATES, LLC

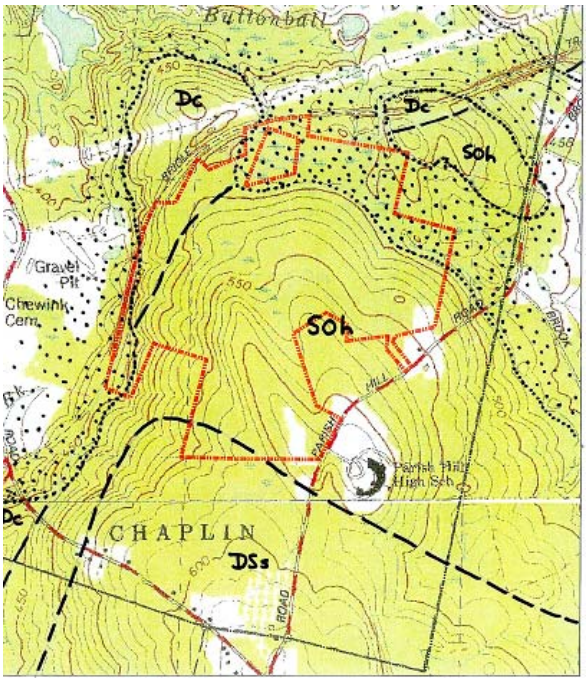

composite plan
SUBDIVISION OPEN SPACE PLAN
OF LAND OF
SPRING VALLEY, LLC
PARISH HILL ROAD
CHAPLIN, CONNECTICUT
HEALEY & ASSOCIATES, LLC
parcel contains 215.813 ± acres

Topography and Geology

Topography

The proposed subdivision is on the north flank of a somewhat elongate hill, at the top of which Parrish Hill High School is located (see Figure 1). The subdivision hill, with a maximum elevation of just greater than 620 feet above sea level, is a satellite hill to Parish Hill (maximum elevation near 650 feet), which is located about a third of a mile to the south. The subdivision hill has a rather smooth topography indicative of subglacial erosion/ deposition (till) and it is elongate in shape similar to a drumlin. At the base of the hill are areas of hummocky topography, indicative of sand and gravel deposits. Indeed, the topographic map of the area indicates active or formerly active gravel extraction immediately west of the parcel.

Figure 1



Bedrock Geology

Outcrops of bedrock were not positively identified on the parcel during the ERT field observation. Granitic gneiss crops out just north or the parcel along the old rail bed. It was exposed during construction of the rail line. Glacial till in the area (see below) contains an abundance of large and small boulders and several areas that were identified as possible outcrop may have been very large boulders. Borings and test pits on the parcel indicate that, in most places, bedrock is covered by six or more feet of glacial soil.

Practically the entire parcel is underlain by Hebron Gneiss (SOh on Figure 1). Scotland Schist (DSs) underlies the southwest corner of the parcel, and Canterbury Gneiss (Dc) underlies the west and northwest portion of the parcel. Rocks and boulders of both Canterbury and Hebron gneisses cover the surface of the parcel. Hebron Gneiss is the oldest rock in the area. It consists of gray and greenish gray gneiss, calc-silicate gneiss, and interbedded gray schist. The Scotland Schist is a silvery gray mica schist that locally is rusty weathering. The Canterbury Gneiss is light-gray granitic gneiss that may have been intrusive into the older rock units.

Quaternary (surficial) Geology

The most striking feature of the parcel is the abundance of boulders that litter the surface and that are encountered at most of the excavation sites that were visited (Figure 2). Boulders up to ten feet in diameter were observed during the ERT field observation. Dealing with the

boulders will be a constant challenge to developers and future home-owners. The upland part of the area is covered by glacial till. Sand and gravel underlie the surface of the northern part of the parcel and a small area on the western border of the parcel.

Figure 2

Although bedrock was not encountered in most of the test pits dug on the parcel the till is thin (10-15 feet or less, Stone et al, 2005). It was deposited by two different processes. The lower part of the till was deposited directly beneath the ice beneath glacial ice; the upper part of the till is a residue of rocky and muddy debris left when the ice melted. If the till were thicker, the hill would be referred to as a drumlin. Indeed, Parish Hill, located just to the south is covered by thick till and is mapped as a drumlin (Stone et al). The till is rocky and abundant boulders are strewn about the surface. The boulders were concentrated at the end of the last ice age when the glacial-ice margin was melting northward. A brief cooling of the climate temporarily stopped the northward recession of the ice margin about 16,500 years ago. The bulk of the ice to the north continued to flow southward toward the ice margin bringing boulders with it. The boulders were deposited at the ice margin by the melting process. Stone et al, 2005 shows two ice margin positions that are located along the northwest border of the proposed subdivision (see Fig. 3).

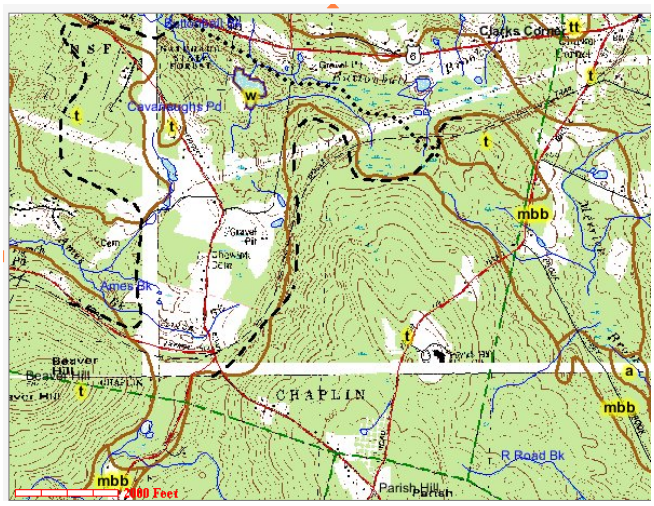


Figure 3. Map showing Quaternary deposits in area of proposed Kimball Woods Subdivision. t = areas covered by glacial till, dotted line = esker deposit of sand and gravel, dashed lined = southerly edge of glacial ice during some stage of recessional melting, mbb = area underlain by sand gravel and silt deposited in a melt-water pond. Map after Stone et al, 2005. Note difference in scale compared with Figure 1.

Deposits of sand and gravel are located along the foot of the hill-slopes. They were deposited by glacial melt-water streams after the ice had receded north of the area. The thickest deposits are likely located on the northern part of the parcel north of a wet-land crossing where 4-6 feet of gravel may be above the water table.

References

Dixon, H. Roberta, and Pessl, Fred, (1966) Geologic map of the Hampton Quadrangle, Windham County, Connecticut. U.S. Geol. Surv. Geologic Quad. Map, #GQ-468.

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.

Conservation District Review

Introduction

This review is based on a conceptual proposal for a subdivision off of Parish Hill Road in the town of Chaplin, Connecticut. The total site is about 216 acres.

According to the information received, a previous subdivision for five lots was approved in 1995 and has subsequently been built. A second subdivision for 14 lots was recently approved for 42+acres of the 216 acres. The pending subdivision proposes a 1,400 foot road with a temporary cul-de-sac. Further development for the remaining 174 acres is in the planning stage and a conceptual plan for 48 lots has been submitted to the Town for its review. The temporary cul-de-sac would be extended in this third proposal to form a loop road back out to Parish Hill Road, crossing through an intermittent watercourse and wetland system. Three separate cul-de-sacs are proposed off the loop road.

The first phase has been fully developed and the second phase was too far along in the permitting process for comments to be incorporated. Therefore this report focuses primarily on the conceptual development plan for the 174 acres. The Eastern Connecticut Conservation District (ECCD) conducted two inspections of this property. The first was on October 24, 2007 as part of the ERT site walk and the second was on November 7, 2007 as a solo expedition.

Site Description

The 174 acre site under review is located in the southeastern part of the Town. It has frontage on Parish Hill Road, which is a town road. The rear property line is defined by a Rails-to-Trails greenway owned by the State of Connecticut. Other open space in the area includes parcels owned by the State of Connecticut, two parcels which are part of a Hunting and Fishing Game Club and a town-owned parcel across the street associated with the High School.

Water Resources

This site lies partially within a public water supply watershed associated with the Natchaug River. Surface drainage from the majority of the site feeds into wetlands and intermittent watercourses which are part of the Natchaug River watershed. The remaining area which is approximately one quarter to one third of the site and located in the eastern part of the property is within the Shetucket River watershed.

Groundwater quality for the site is shown as GAA or GA indicating it is of natural quality or suitable for drinking, according to the Connecticut Department of Environmental Protection (CTDEP). Surface water quality is A or AA, which is rated good to excellent.

Wetlands on the property have been delineated in the field and shown on the site plan. A brief description of all the wetlands on the 214 acres is included in this section since wetlands in the Phase II (48 acre) are proposed to be placed in open space which may be contiguous to new open space parcels.

Following a general description of each wetland is a table assessing the value of each system. The references in direction in this report are based on the main plan sheets because there appears to be a discrepancy in the position of the north arrow on some of the inset maps and main plan sheets. A map has been included at the end of this section with letter notations that correspond to specific locations described.

Starting from the most southern part of the site there is a wetland system (A) running parallel to the southern property line border. This is a narrow wetland band that extends off the property. Water appears to flow intermittently through this wetland, although there is no well defined channel. Microtopography consists of hummocks throughout the area, caused by elevated root masses, due to high water tables. The site is wooded with a canopy of red maple with some oak, hickory and birch on fringe areas. The understory is dominated by winterberry, tall-bush blueberry and witch hazel shrubs.

Moving slightly north, there is another mapped wetland system (B), which is located entirely on the property. Although it is present in a wooded area, the site was recently timbered and therefore this wetland has a relatively open canopy with increased herbaceous layers consisting of sweet fern, sedges, goldenrod, soft rush, blackberry switch grass, tansy, and wool grass. Small pockets of water are likely present in the springtime, however there does not appear to be any permanent surface water.

The third wetland system (C) on the property is located in the middle of the site and runs approximately southeast to northwest until it splits. One split section heads due west, forming an intermittent watercourse channel and crosses the Rails-to-Trails system via an old stone culvert (E) as shown on the right. It was dry at both times of inspection. The second wetland section heads in a northerly direction where it joins another larger wetland system (D), before exiting the

site, again under the trail through a stone culvert (F), shown in the left picture. At the time of the second inspection, this culvert was flowing, but was almost entirely blocked due to years of organic build-up.

The large wetland system (D) that runs along the eastern property line is contiguous to the middle wetland system. Further, this wetland system has a drainage divide, where part of the system drains to the Natchaug River and the other part drains to the Shetucket River. These wetlands were modified as part of the railroad bed construction. The

wetlands in this location are densely vegetated with species such as red maple, sweet pepper bush, cinnamon fern, tussock sedge and sphagnum moss. Water was present, ponded at the surface and hummocks within the system are pronounced. Flooding is common in portions where elevations are almost flat. These wetlands are formed in very poorly drained soils, with organic matter in the range of 16-51 inches deep.

The part of the wetland system that drains to the Shetucket River forms a watercourse as it exits the site to the east.

Generally speaking, wetlands systems provide a host of valuable functions including, habitat for wildlife, drainage conveyance, flood storage capacity, groundwater recharge water cleansing, aesthetic and educational values. The larger wetland systems on the northeastern part of the site are very valuable systems as they provide all the functions listed above. The narrower wetland systems provide some of the functions listed above, but would be considered less valuable. They are however important because they form part of the headwaters of significant watercourses.

Wetland Function	**Larger Wetland System along northeastern property line (D)**	**Narrower Band Wetland Systems (A & C)**	**Closed Wetland System (B)**
Habitat Resources	High	Medium	Low
Drainage conveyance	High to Medium	Medium	Low
Groundwater Recharge	High	Medium to Low (steeper slopes)	Low
Groundwater Discharge	High	Medium	Low
Water Polishing/Treatment	High	Medium to Low (steeper slopes)	Medium
Aesthetic Value	High	High to Medium (as buffer areas)	Low
Recreational Value (passive recreation, i.e. bird watching, hiking)	High	Medium to Low	Low
Flood Storage Capacity	High	Low (steeper slopes)	Low

Please note that this chart is based on general observations of the wetland systems. Further review is warranted at the time of any site specific planning.

Vegetation

The site is wooded, with the exception of a field off of Parish Hill Road, where the temporary cul-de-sac is now proposed. Much of the area has been timber harvested recently, and therefore the canopy layer is light. The canopy consists of oak and hickory with some birch, beech, and cherry. Understory includes musclewood, chestnut saplings, witch hazel and blueberry. The herbaceous layer is well established throughout the site, as a result of timbering, and consists of goldenrod, blackberry, calico aster, wild carrot, tansy, Christmas fern, princess pine, mullein, a variety of grasses and large areas of hay-scented fern.

Topography and Soils

The site is gently to mostly moderately sloping with some areas of steep slopes. The parcel is situated on top of a hill with the high points closest to Parish Hill Road and the low points along the greenway trail. Actual elevations were too small on the prints to read the numbers, however slopes appear to drop well over 160' over a distance of about 3000 feet from high to low points.

The small scale soil mapping provided on the plan should be updated to match the official Soil Survey per the NRCS Web Soil Survey. Some of the names and designations have been altered. The majority of the site proposed to be developed per the web survey is shown as very stony, Paxton and Montauk fine sandy loams, with 3 to 15 percent slopes, per the NRC Soil Website. Following is a short description of the soils for each soil, based on the website:

PAXTON SERIES

The Paxton series consists of well drained loamy soils formed in lodgement till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level to steep soils on till plains, hills, and drumlins. Slope ranges from 0 to 45 percent. Saturated hydraulic conductivity is moderately high or high in the surface layer and subsoil and low to moderately high in the substratum. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

Drainage and Permeability: Well drained. Surface runoff is negligible to high. Permeability is moderate in the solum and slow or very slow in the substratum. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum.

Use and Vegetation: Many areas are cleared and used for cultivated crops, hay, or pasture. Scattered areas are used for community development. Some areas are wooded. Common species include white, and black oak, hickory, sugar maple, red maple, gray and black birch, white pine, and hemlock.

MONTAUK SERIES

The Montauk series consists of very deep, well drained soils formed in till derived primarily from granitic materials. These soils are on upland till plains and moraines. Slope ranges from 0 to 35 percent. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. Mean annual temperature is about 49 degrees F, and mean annual precipitation is about 45 inches.

Drainage and Permeability: Well drained. Runoff is low to high. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum.

Use and Vegetation: Many of the nearly level and gently sloping areas are cleared and used for production of potatoes and vegetable crops, hay, silage corn and pasture. Steeper and uneven areas are largely forested. Woodland contains red oak, white oak, and occasionally yellow poplar, white pine, red pine, sugar maple, beech and birch.

Included at the end of this section is a table indicating the ratings for soil suitability for a variety of development activities.

Site Layout & Open Space

As proposed, the site will be developed with a loop road with three cul-de-sacs extending off of it. Open space set asides would likely be placed along the greenway, wetlands and associated buffers and some of the steeper sloped areas. The Town's new Subdivision Regulations for cluster subdivisions require an open space set-aside of 40 percent of land. Lots would be approximately one acre is size with on-site septic and wells. Testing for the lots however has not been completed at this time.

The town has not yet decided who will take over the road system, as Chaplin has not had a subdivision with a road for many years. As proposed, one of the cul-de-sacs would have a right-of-way for future development while the other two would remain as permanent cul-de-sacs.

One of the primary concerns with development of this site will be the amount of stormwater generated as the majority of the site drains toward the Rails to Trails greenway (G) which has very limited culverts (See comments under Stormwater section). Even with culvert maintenance drainage from this site is restricted.

Recommendations:

- If rear lots (flag lots) are allowed, the Town may wish to request that the developer consider this approach: By reducing the amount of frontage needed for at least some of the lots, two of the cul-de-sacs on the eastern part of the property could be eliminated. This would reduce construction costs as well as long-term maintenance costs.

- Alternatives that would reduce the amount of impervious coverage should be considered. Not only does this reduce site runoff but will also improve water quality. Areas where impervious surfaces could be lessened include the following:
    - Reduce road length by eliminating two cul-de-sacs.
    - Encourage shared driveways and promote pervious surfaces where appropriate.
    - Limit the amount of lot clearing to only what is essential for lot development.
    - Encourage rain harvesting (rain barrels), rain gardens or infiltration areas for impervious surfaces such as roofs.
- It is recommended that the subdivision be designed so that lots are located out of the inland wetlands regulated area. This will reduce wetland permitting requirements, enforcement issues in the future and assists in creating wildlife corridors between larger open space parcels. Lots where the majority of the "buildable land" is within regulated setbacks should be eliminated.
- A trail system should be laid out from several points on the proposed road to connect to the greenway (G). If the Town does not wish to have trails developed at the time of the subdivision, set asides or right-of-ways can be used to reserve the areas for future use. Wetland crossings and steep terrain should be avoided in any trail layout to reduce environmental impact.
- Open space areas for habitat preservation are most effective when they contain large areas of undisturbed land and passageways that allow movement of animals with little human contact. Therefore, placing open space so that it protects sensitive resources such as wetlands and steep slopes as well as being contiguous or linked to other larger parcels of protected areas will be beneficial to native wildlife.

Stormwater

Since the plans are only in the preliminary stage, stormwater conveyance and treatment methods have not yet been designed. Based on the temporary cul-de-sac road proposal however, it appears that typical curb and catch basins would be proposed along with some end of pipe treatment. As this is a new subdivision, it is an opportunity to incorporate Low Impact Development (LID) initiatives to reduce the impacts of stormwater.

Recommendations:

- A hydraulic study showing pre and proposed conditions is warranted for this site. Existing drainage patterns should be followed so that water is not being diverted from one watershed to another. It is very likely, due to the drainage restrictions off site that on-site detention will be necessary by use of a detention basin. A common technique in stormwater management is to simply hold the peak discharge so that the pre-development peak is not exceeded. This usually means that the peak discharge is also being extended. If that is the case, careful review of down gradient channels and their erodibility, as well as the increase in peak flows lower in the watershed should be evaluated.

- An alternative to standard curb and basin method for stormwater treatment that the town may wish to consider would be curbless roads with grassed swales. This is most appropriate in gentler sloped road areas with less then 5% grade. By incorporating perpendicular berms, swales can also be built to provide stormwater volume storage to reduce peak flows. If constructed with flat bottoms they have the added benefit of allowing a high surface contact with stormwater thus reducing waterborne pollutants. Again, proposed drainage patterns should be designed to mimic existing drainage patterns.
- While stormwater quantity is a concern, stormwater quality should also be a high priority. Stormwater treatment should be designed with a treatment train approach. Specifically, this is where several methods of stormwater treatment are used in a series to remove pollutants. A combination of structural and biological controls should be incorporated for more effective treatment.
- As mentioned in the previous section, encouraging infiltration wherever possible should be another goal to reduce stormwater impacts. Roof runoff treatment via infiltration or rain gardens should be promoted as well as pervious driveways.
- Long-term maintenance requirements should be specified as part of any request for permitting. Ease of maintenance should be a key consideration when designing stormwater management practices. Basins and outlets must be required to have accessible maintenance points to be routinely cleaned. A stormwater management plan is only as good as its long term maintenance is conducted.

Wetland Issues

The primary direct impact to inland wetlands is the proposed crossing (C). The area where the crossing is proposed has already been disturbed due to the previous timber harvest operation as shown in the picture to the right. There are two visible intermittent channels where surface water appears to flow during periods of rain or in the spring. The proposed crossing area is currently rutted. Logs used for corduroy crossings are still present and the site is open. While this is not the desirable way for a temporary crossing to have been restored and stabilized, it is a good location from a wetlands standpoint to create a permanent crossing if one is required. A question was raised at the ERT meeting on whether; a) a through road was desirable; b) the crossing should be restricted to an emergency access or c) whether a crossing should be proposed at all. Through roads generally offer better travel patterns and reduce issues with emergency access. This however needs to be weighed against the environmental impact. In consideration of the value of the wetland system, where it is proposed to be crossed and the long term public benefit of a through road, it is ECCD's opinion that a permanent crossing in this location would be acceptable from an inland wetlands impact viewpoint if certain steps are taken.

Recommendations:

- A minimum of two culverts should be used to allow water to flow in as much of the natural pattern as existing. Culverts should be placed at existing channel points.
- The height of the road should be kept to the minimum possible to reduce the amount of fill in the wetlands from side slope grading. Alternatives to reduce the depth of fill could include replacing one larger sized pipe with several smaller pipes, since a minimum of 1-2 feet of pipe cover is typically required.
- Storm drainage should not be discharged directly to inland wetlands (See Stormwater Section for further recommendations).
- Flared-end inlets/outlets should be used to minimize erosion potential.
- The crossing should be constructed during the time of year when surface water flow is minimal. Construction sequencing and specifications should address erosion controls, side slope stabilization, dewatering methods and inspections.

Other wetland impacts associated with development of this site are stormwater discharge, clearing of vegetation adjacent to wetlands and site erosion. These are addressed under *Stormwater, Site Layout and Open Space* and *Erosion Control* sections respectively. ECCD has provided one further recommendation in relation to one potential wetlands impact due to stormwater discharge.

Recommendation:

- While the larger wetland system in the northeastern part of the property is valuable for its flood storage capacity, too much flooding of the area will alter the vegetation. If stormwater will be directed to this area, even if the outlet is a distance from the wetland itself, surface water will collect in this system. Further review by a botanist or wetland specialist on the depth and duration of flooding should be conducted if stormwater will be discharged to this area.

Erosion Control

As with construction on any site, erosion and sediment control is paramount in protecting down-gradient wetland and watercourses. Again, since this is a preliminary layout plan, sediment and erosion control details have not been included on the plans. The final subdivision plans should incorporate certain design criteria.

Recommendations:

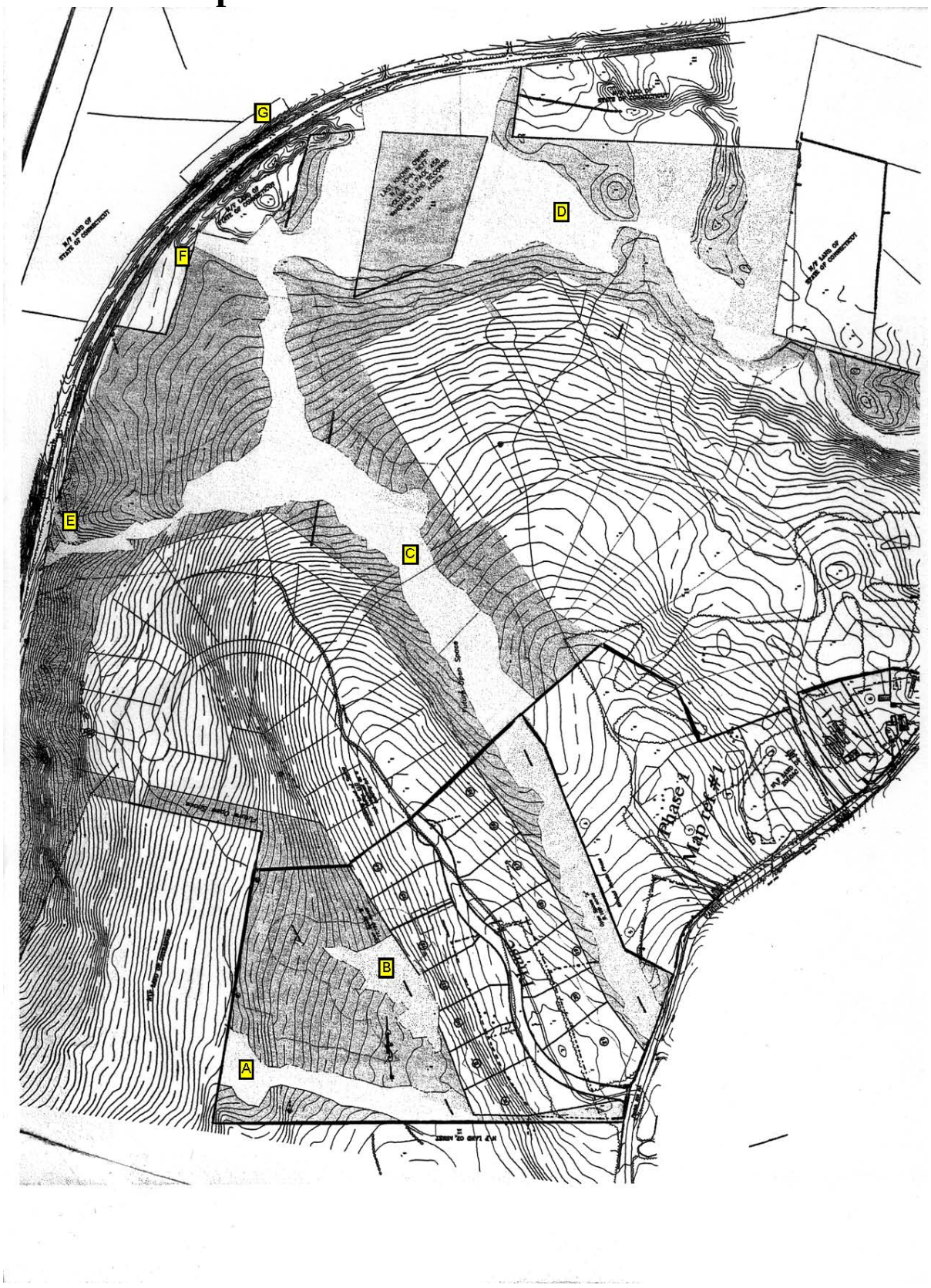
- Since this is a large development, phasing of the build-out should be considered. Phase lines should be clearly delineated and should include what activities will be conducted and include stabilization requirements for each phase.
- Continual stabilization throughout active construction should be a main priority.
- Construction of any of the stormwater treatment areas should be conducted in the beginning to allow for complete stabilization prior to the stormwater systems being activated.

- Some types of stormwater controls, i.e. basins and swales, can also be used as temporary diversion and settling areas to prevent silted water from entering wetlands and watercourses. If this technique is proposed, temporary stabilization, clean-out and inspection requirements should be detailed on the plans.
- On-site inspection should be conducted daily and especially prior and following any significant rain events. Some towns have requested weekly inspections during active construction periods be conducted by a professional trained in erosion control methods, with reports being submitted to Planning and Zoning Department.

Conclusion

This proposed subdivision is conceptual in nature and therefore ECCD's comments are directed towards items which should be considered in final plan preparation. Seeking review comments during various phases of the planning process is essential in preparing a well thought out plan that balances site development with resource protection. ECCD applauds the Town of Chaplin and the developer for taking this first step toward responsible development.

Wetlands Map



Selected Soil Interpretations

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Report—Selected Soil Interpretations

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - dwellings with basements		Eng - lawn, landscape, golf fairway (ct)		Eng - local roads and streets	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3—Ridgebury, Leicester, and Whitman soils, extremely stony							
Ridgebury	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Depth to pan	0.99	Frost action	1.00
Leicester	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Frost action	1.00
Whitman	15	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to pan	1.00	Depth to saturated zone	1.00
				Depth to saturated zone	1.00	Frost action	1.00
15—Scarboro muck							
Scarboro	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Organic matter content	1.00	Depth to saturated zone	1.00
				Depth to saturated zone	1.00	Frost action	0.50

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - dwellings with basements		Eng - lawn, landscape, golf fairway (ct)		Eng - local roads and streets	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
17—Timakwa and Natchaug soils							
Timakwa	45	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Organic matter content	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Subsidence	1.00			Shrink-swell	1.00
		Shrink-swell	1.00			Subsidence	1.00
Natchaug	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Frost action	1.00
		Subsidence	1.00			Subsidence	1.00
						Flooding	0.40
23A—Sudbury sandy loam, 0 to 5 percent slopes							
Sudbury	80	Very limited		Not limited		Somewhat limited	
		Depth to saturated zone	1.00			Depth to saturated zone	0.03
38C—Hinckley gravelly sandy loam, 3 to 15 percent slopes							
Hinckley	80	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.04	Droughty	1.00	Slope	0.04
				Large stones content	0.11		
				Gravel content	0.05		
				Slope	0.04		
38E—Hinckley gravelly sandy loam, 15 to 45 percent slopes							
Hinckley	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Droughty	1.00		
				Large stones content	0.11		
				Gravel content	0.05		

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - dwellings with basements		Eng - lawn, landscape, golf fairway (ct)		Eng - local roads and streets	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
47C—Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony							
Woodbridge	80	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.46	Frost action	0.50
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.19
				Large stones content	0.01	Slope	0.04
59C—Gloucester gravelly sandy loam, 3 to 15 percent slopes, extremely stony							
Gloucester	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.04	Slope	0.04	Slope	0.04
62C—Canton and Charlton soils, 3 to 15 percent slopes, extremely stony							
Canton	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.04	Slope	0.04	Frost action	0.50
						Slope	0.04
Charlton	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.04	Slope	0.04	Frost action	0.50
						Slope	0.04
73C—Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky							
Charlton	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.04	Slope	0.04	Frost action	0.50
						Slope	0.04
Chatfield	30	Very limited		Somewhat limited		Somewhat limited	
		Depth to hard bedrock	1.00	Depth to bedrock	0.54	Depth to hard bedrock	0.54
		Slope	0.04	Slope	0.04	Frost action	0.50
						Slope	0.04

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - dwellings with basements		Eng - lawn, landscape, golf fairway (ct)		Eng - local roads and streets	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes							
Paxton	55	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.79	Frost action	0.50
				Large stones content	0.01	Depth to saturated zone	0.19
Montauk	30	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.84	Frost action	0.50
						Depth to saturated zone	0.03
85B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony							
Paxton	55	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.79	Frost action	0.50
				Large stones content	0.01	Depth to saturated zone	0.19
Montauk	30	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.84	Frost action	0.50
						Depth to saturated zone	0.03
86C—Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony							
Paxton	55	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.79	Frost action	0.50
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.19
				Large stones content	0.01	Slope	0.04
Montauk	30	Very limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to pan	0.84	Frost action	0.50
		Slope	0.04	Slope	0.04	Slope	0.04
						Depth to saturated zone	0.03

Selected Soil Interpretations

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Report—Selected Soil Interpretations

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - infiltration systems (ct)		Eng - soil potential ratings of ssds (ct)		Eng - storm water basins (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3—Ridgebury, Leicester, and Whitman soils, extremely stony							
Ridgebury	40	Very limited		Extremely low potential		Very limited	
		Depth to saturated zone	1.00			Depth limited	1.00
		Thin layer	1.00				
		Restricted permeability	0.50				
		Dense layer	0.34				
Leicester	35	Very limited		Extremely low potential		Very limited	
		Depth to saturated zone	1.00			Depth limited	1.00
Whitman	15	Very limited		Extremely low potential		Very limited	
		Depth to saturated zone	1.00			Depth limited	1.00
		Thin layer	1.00				
15—Scarboro muck							
Scarboro	80	Very limited		Extremely low potential		Very limited	
		Depth to saturated zone	1.00			Depth limited	1.00

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - infiltration systems (ct)		Eng - soil potential ratings of ssds (ct)		Eng - storm water basins (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
17—Timakwa and Natchaug soils							
Timakwa	45	Very limited		Extremely low potential		Very limited	
		Depth to saturated zone	1.00			Flooding	1.00
		Flooding	0.40			Depth limited	1.00
Natchaug	40	Very limited		Extremely low potential		Very limited	
		Depth to saturated zone	1.00			Flooding	1.00
		Flooding	0.40			Depth limited	1.00
23A—Sudbury sandy loam, 0 to 5 percent slopes							
Sudbury	80	Very limited		Low potential		Unlimited	
		Depth to saturated zone	1.00				
		Slope	0.02				
38C—Hinckley gravelly sandy loam, 3 to 15 percent slopes							
Hinckley	80	Very limited		Low potential		Unlimited	
		Slope	1.00				
38E—Hinckley gravelly sandy loam, 15 to 45 percent slopes							
Hinckley	80	Very limited		Low potential		Very limited	
		Slope	1.00			Slope	0.88
47C—Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony							
Woodbridge	80	Very limited		Low potential		Unlimited	
		Depth to saturated zone	1.00				
		Thin layer	1.00				
		Slope	1.00				
		Restricted permeability	0.97				

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - infiltration systems (ct)		Eng - soil potential ratings of ssds (ct)		Eng - storm water basins (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
59C—Gloucester gravelly sandy loam, 3 to 15 percent slopes, extremely stony							
Gloucester	80	Very limited		High potential		Unlimited	
		Slope	1.00				
62C—Canton and Charlton soils, 3 to 15 percent slopes, extremely stony							
Canton	45	Very limited		High potential		Unlimited	
		Slope	1.00				
Charlton	35	Very limited		High potential		Unlimited	
		Slope	1.00				
		Restricted permeability	0.50				
73C—Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky							
Charlton	45	Very limited		Low potential		Unlimited	
		Slope	1.00				
		Restricted permeability	0.50				
Chatfield	30	Very limited		Low potential		Very limited	
		Slope	1.00			Bedrock	0.89
		Thin layer	1.00				
		Restricted permeability	0.49				

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - infiltration systems (ct)		Eng - soil potential ratings of ssds (ct)		Eng - storm water basins (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes							
Paxton	55	Very limited		Medium potential		Unlimited	
		Depth to saturated zone	1.00				
		Thin layer	1.00				
		Restricted permeability	0.97				
		Slope	0.74				
Montauk	30	Very limited		Medium potential		Unlimited	
		Depth to saturated zone	1.00				
		Thin layer	1.00				
		Dense layer	0.99				
		Slope	0.74				
		Restricted permeability	0.50				
85B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony							
Paxton	55	Very limited		Medium potential		Unlimited	
		Depth to saturated zone	1.00				
		Thin layer	1.00				
		Restricted permeability	0.97				
		Slope	0.74				
Montauk	30	Very limited		Medium potential		Unlimited	
		Depth to saturated zone	1.00				
		Thin layer	1.00				
		Dense layer	0.99				
		Slope	0.74				
		Restricted permeability	0.50				

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - infiltration systems (ct)		Eng - soil potential ratings of ssds (ct)		Eng - storm water basins (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
86C—Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony							
Paxton	55	Very limited		Medium potential		Unlimited	
		Depth to saturated zone	1.00				
		Slope	1.00				
		Thin layer	1.00				
		Restricted permeability	0.97				
Montauk	30	Very limited		Medium potential		Unlimited	
		Depth to saturated zone	1.00				
		Thin layer	1.00				
		Slope	1.00				
		Dense layer	0.99				
		Restricted permeability	0.50				

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

Wetlands Review

The Kimball Woods site was visited on the 24th of October, 2007. There had been a light rain earlier that morning and a combined 1.55 inches on the 19th and 20th. This Team member missed the information meeting and the more formal gathering of constituents for the field walk which began on Parish Hill Road, his access to the property was north along the rail trail from Chewink Road.

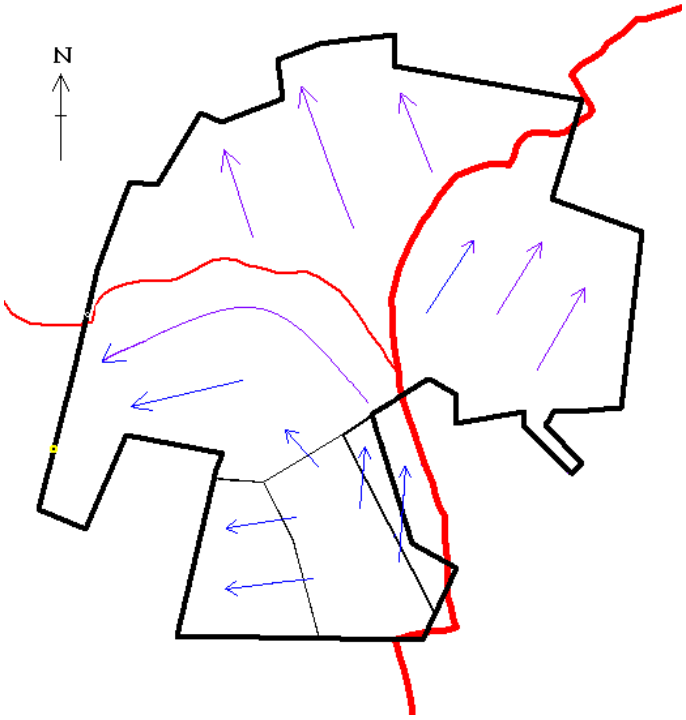
Discussion

On this ~216 acre property nearly 75 per cent of the soils are sandy loams. There are about 20 per cent in wetland soils, and, as is typical of Connecticut's uplands, these soils are distributed across the property. The USDA Natural Resources Conservation Service (NRCS) digital soil survey (WSS) shows the soils mapping percentages at http://websoilsurvey.nrcs.usda.gov/ .

The Kimball Woods property is shown here with approximate boundaries in black on the 2004 aerial photo base. Wetlands of varying degrees of drainage are shown in color. This general wetland soils overview is limiting because it maps only soil locations larger than three acres. Thus, the use of a soil scientist to map the entire site is always mandatory as was done here. For instance, in this view the wetland soils abutting lots 10, 11 and 12 are not shown.

The parcel is split by a regional drainage divide. About 24 percent of the land, mostly in the northeast, drains east to the Shetucket River. The remaining 76 percent drains west to the Natchaug River. The 76 percent, or about 164 acres, that flows west is further divided north and south. The northern section, ~71 acres, drains into the Buttonball Brook drainage, while

the balance, ~93 acres, upon which this subdivision is located, drains into Ames Brook. Thus the entire property, and all of the wetlands, sit at the top of various watersheds.



Sitting at the top of a three way drainage divide, the site sheds water to the Buttonball, Ames and Nachaug river watersheds. The approximate site boundary is shown in black. The drainage divide lines are depicted in red. Generalized water flow and direction are given in blue.

Observations

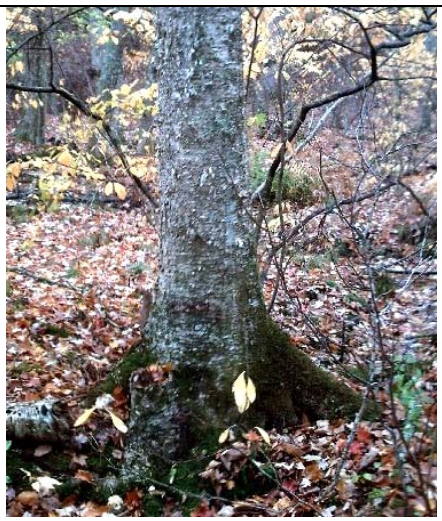
Generally, the wetlands were dominated by wetland soils, not so much by familiar wetland vegetation. Only two areas on this visit had surface water present. Almost uniformly across the wetlands on the site there were three levels of rich foliage. The herb layer was dominated by a diversity of vegetation with various fern species in the wettest areas. The shrub layer was present but not quite as dense, possibly due to the extensive, sun shading tree canopy. The tree layer was dominated by Red maple (*Acer rubrum*) and Yellow birch (*Betula alleghaniensis*) and, where not subjected to previous cutting, formed a dense canopy.

The Wetlands Described

Southwest Wetlands

Just inside the east rail trail boundary of the property were wetlands most recognizable to the general public. These soils were deep and mucky (over shoe tops) with many organics and a high water table. There are some areas of limited, but open, flowing water. Trees used to having “wet feet” dominate and are buttressed against the long term high water table

On the graphic above which shows the property boundary on the black and white aerial photo base, two small yellow circles dot the parcel boundary on the west side. Those show the approximate location of the two stone culverts which pass to the west under the rail trail.



These two photos (above) were taken at/near the southern culvert under the rail trail. This is one of the rare spots on site where surface water was present, as seen along the bottom of the left hand image. This is the same area where yellow birches stand buttressed against the high water table which, because of its saturation, also limits the growth of the herbaceous layer. The northern culvert which drains the large hillside wetland was dry at this time.

The Hillside Wetlands

East-northeast of this wetland, the large linear wetland near the center of the parcel was a cause of concern. It is located on a hillside sloping down from its high elevation by Parrish Hill Road in the southeast (610 feet) and dropping to about 490 feet by the large wetlands in the northwest of the property. This rather gently sloping (4 percent gradient) hillside wetland was wet but showed no sign of flowing water.

In and near the boundaries of this hillside wetland trees had been harvested, dropped and left within the wetland review area and within the wetland itself.

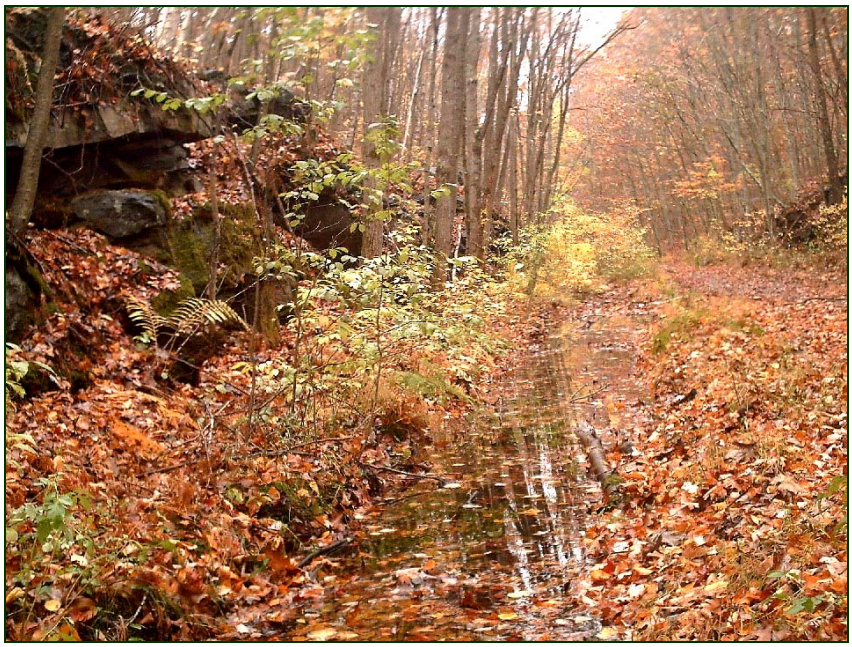
The stump in the foreground is the result of a tree having been cut within the bounds of the flagged hillside wetland. The draped wetland flag is easily visible on the tree “above” the stump.

The white line in the photo above indicates the approximate continuation of the wetland boundary towards the viewpoint.

In the photograph below the tree above is clearly marked with a wetland flag yet the refuse of the wood cutting operation remains on the landscape, both inside and outside of the flagged wetland boundary.

Trees were felled into, and subsequently left within, the flagged wetland on the hillside.

Wetlands along the Trail -
To the north and northwest, up around the curve in the rail trail, the opportunity for vernal pools exists along the road cut. The depression between the road bed and the rock wall is relatively extensive, (fore-ground in photo at right).



This second of the two open water wetlands is free of predacious fish, and has what appears to be a long water retention time. It would be worth studying in the springtime to understand the use of this wetland by any of the local amphibian populations.

Wetland Location

All wetlands are important to the ecology of their area, and these especially so because they occur at the top of the watershed. At this location they are fragile and vulnerable to impacts (sediment loading for example) since they lack the benefit of upstream flow to dilute pollutants and, since they are at the top of the watershed, they have limited flow intensity to assert themselves on the landscape.

While some wetlands are isolated (vernal pools for example) for these wetlands that contribute to downstream flow it is imperative that all water flowing from this area be maintained both in quality and quantity as it mixes with downstream waters.

After Phase Two?

There are things evident in the recently approved Phase II that are especially disconcerting if the land use decisions made on this proposal are extrapolated into the future. First and foremost is the concern of encroachment into the wetland and encroachment into the wetland buffer. With 216 acres of real estate to be developed, it is difficult to justify the need to encroach upon the wetlands.

Wetland Setbacks / Buffers / Review Areas

By whatever name they are referred to, vegetated buffers protect wetlands. The Center for Watershed Protection in their publication: *Adopting Watershed Tools to Protect Wetlands* says it plainly,

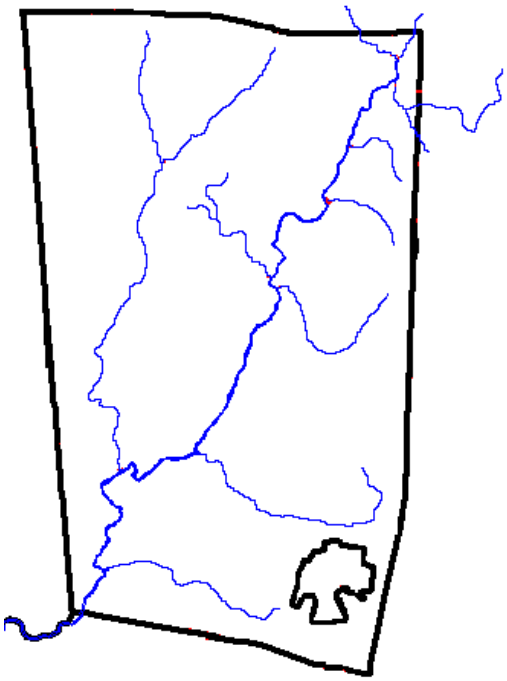
> "Wetland buffers provide habitat for wildlife, remove pollutants from runoff, reduce erosion, regulate temperature, store floodwaters, and increase aesthetic and recreational value.
>
> They also provide a visual separation between wetlands and developed areas that discourages dumping, reduces human access to the site, and creates a greater distance between the wetland and surrounding human development. The benefits provided by a buffer vary depending on the buffer width.
>
> Buffer widths of 50 to 100 feet are typically recommended to protect wetland water quality, while buffer widths of 100 to 300 feet or more are recommended for wetlands with important wildlife functions. This width should be expanded to include nearby sensitive resources, such as steep slopes or erodable soils, and to account for factors such as adjacent land use, buffer vegetation, and the size of the wetland. Buffers are measured horizontally from the edge of the delineated wetland."

Chaplin, as with many Eastern Connecticut towns, has the advantage of preplanning for sure-to-come development before it occurs. And as development does occur, the biggest effects upon, and losses to, the wetlands will be cumulative impacts. Probably no single plan or subdivision will "ruin" the ecology of a wetland system, but when taken together several years from now, the impacts of seemingly minor things wrong with <u>many</u> subdivisions will, when combined, be deleterious. Extended impacts could affect fisheries and wildlife. The issues will revolve around water: its quality and its quantity. Thus the message of this report is that strong protection of wetlands and watercourses now will guarantee fewer problems in the years to come.

The best way to avoid these errors is to understand the flow dynamics of water and wetland systems in the town.

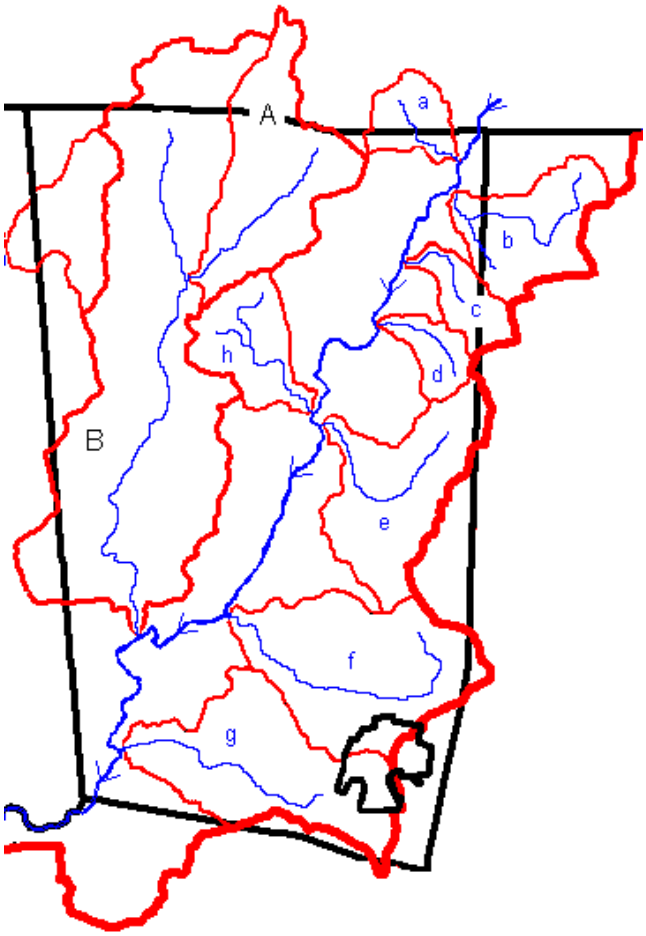
The Wetlands and Watercourses

As seen below, many rivers drain the town, but the dominant river is the Natchaug River which runs from the northeast corner to the southwest corner of town and into which most all of the town drains. Indeed the Natchaug splits Chaplin just about in half.



From the hills on both sides of the river valley slant the tributaries that drain the hillsides and add to the flow of the Natchaug. The approximate boundary of the Kimball Woods property is shown in black

Below is the same graphic but with the addition of the individual watershed boundaries.



The Natchaug River is shown as the heavy blue line diagonally bisecting town. Arrows show the direction of flow. The watersheds of ten tributaries of the Natchaug are delineated in red and individually labeled with letters.

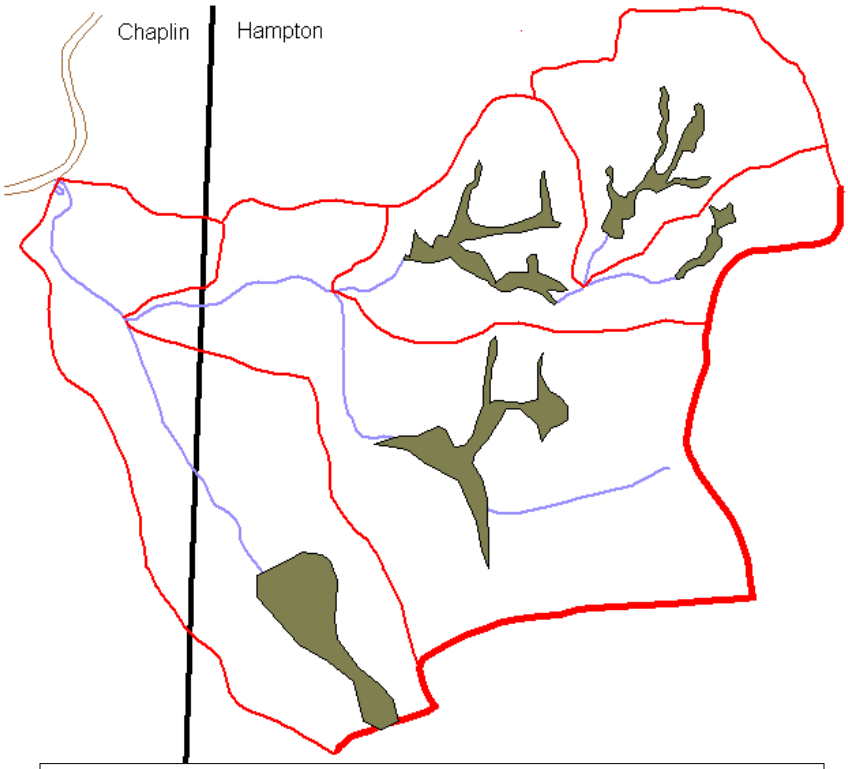
The drainage patterns differ on each side of the Natchaug. The western side is drained primarily by Stonehouse Brook whereas the east side is drained by seven small watersheds labeled with lower case letters “b” through “g”.

The individual drainages are: A. Stonehouse Brook, B. East Branch Stonehouse Book, a. Reed Brook, b. Goodwin Brook, c. Whitman Brook, d. unnamed, e. Turner Brook, f. Buttonball Brook, g. Ames Brook, h. unnamed.

This simplified graphic gives an idea of how the water in town drains. Each drainage is separate from the other, that is, if there is an oil spill in drainage "f" there would be no impact to neighboring drainages "e" or "g". However, that oil spill would travel downstream and empty into the Natchaug River potentially contaminating those waters.

It is also easy to see that watersheds are shared between towns. Watersheds b, c, e and f for instance have their headwaters in Hampton to the east. Both Stonehouse and the East Branch of Stonehouse Brook, A and B, and Reed Brook, .a, have their headwaters in Ashford to the north.

One caveat with this graphic is that it is greatly simplified. Whereas it might appear that all basins are drained by one stream, typically the main stream has tributaries of its own. In addition, most often the watercourses connect wetlands and ponds like beads on a string. The graphic below illustrates this point taking a closer look at drainage basin "c", Whitman Brook.



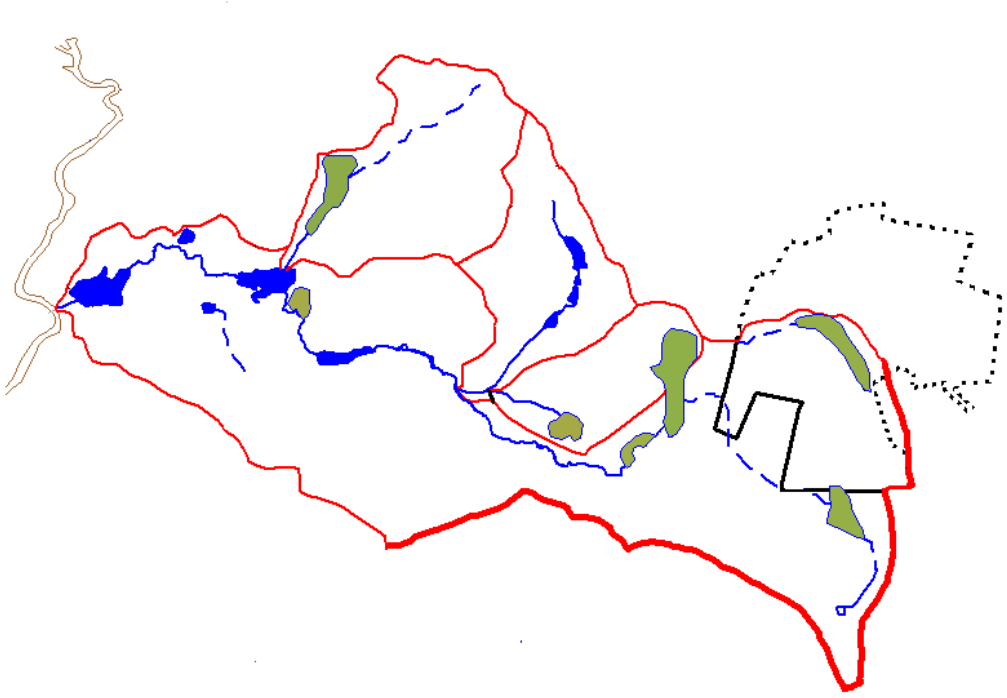
This is the drainage labeled "b", Whitman Brook in the graphic above.

Here the drainage delineations for Whitman Brook are plotted in red - further subdividing the wetland and watercourse systems within the Whitman Brook watershed. The green color is representative of wetlands.

These wetlands positioned as they are along the watercourse add to its flow throughout the year as they transfer water downslope to the west and into the Natchaug River (seen at the top left of the image). It is an interesting aside that most of the land that sheds water into the system is in the

town of Hampton. Thus the upstream land use decisions that affect water quality and quantity can be, and are, effected by actions one, and sometimes many, towns away.

Below is the delineation of the Ames Brook watershed. All water flow and all wetland systems contribute to the east-to-west downstream flow into the Natchaug River. This drainage has been subdivided into four basins and could be subdivided even more.



Impervious Surfaces

One goal of every development in town should be to minimize impervious surface and recharge runoff into groundwater as much as possible. Reducing impervious surfaces reduces stormwater runoff thereby easing pressure on storm drainage systems. Recharging as much as possible into the ground water will keep the hydrologic system as close to predevelopment levels as possible.

Road width is a large factor when impervious surface is being considered. With approximately 1,400 feet of road proposed for this phase, and more planned for additional phases in the future, the differences in road width can yield both substantive reductions in impervious surfaces and cost savings for the developer.

Regarding the factors of impervious surface, road width, and safety, included below is language from University of Connecticut's Nonpoint Education for Municipal Official's (NEMO) website (http://nemo.uconn.edu) that addresses the issue.

NEMO TECHNICAL PAPER NUMBER 1: "Research shows that for most local roads all that is needed is 20' or 24' road widths composed of two 10' or 12' travel lanes.

Design Speed - As design speed declines, road widths narrow. Research shows that long, wide, straight roads produce higher traffic speeds *and* higher accident counts, particularly fatal accidents. Local residential roads should be designed to provide safe access to home sites and not as mini raceways. Research shows that narrow streets are the safest. For example, a study by Swift Associates and the City of Longmont, Colorado looked at 20,000 automobile accidents over an eight-year period and found, "The most significant casual relationships to injury and accident were found to be street width and street curvature." According to the Swift Report, "... as the street widens, accidents per mile per year increases exponentially, and that the safest residential street width is 24 feet."

With the goal of minimizing impervious surface, a road width of 24 feet over the length of the project can be substantial. Additionally, applications of road sands would be decreased with the narrower road – a decrease in sediment loading that will have a positive impact on wetlands and watercourse. If the road network is ever built as proffered in the composite plans of April 24, 2007 total road length could be approximately 7,000 feet. Thus over the length of the project many thousands of impervious square feet can be saved. (The savings will be almost exponential if applied townwide.) The table below shows the differences:

	Phase II **Road length: 1,400'**	**Kimball Woods Concept** **Road length: 7,000'**
Impervious Surface **28 foot width**	39,200 square feet	196,000 sq. feet (4.5 Acres)
Impervious Surface **24 foot width**	33,600 square feet	168,000 sq. feet (3.86 Acres)
Impervious Surface **Savings**	5.600 square feet	28,000 sq. feet (~2/3 acre)

Conclusion

Every development plan should show respect for the wetland boundaries and the wetland set back areas. Decision makers should understand the system each wetland is part of. The boundaries of these systems are the drainage basin lines.

Post ERT meeting discussion among members revealed that within the wetlands and the wetland review areas, trees were NOT to be cut and logging refuse left. Thus, Chaplin will have to take steps to ensure this type of unsupervised activity no longer takes place and that it is not an indication of future performance. The town must find a way to ensure that plans are kept within 'as-built' specifications and agreements. Perhaps the town can incorporate into their zoning laws a provision for applicant to pay for a mutually agreed upon investigator to review and report to the town at agreed upon intervals (once, twice a day/week etc.).

But the cutting of trees on the hillside wetland is not the only infraction regarding the long term health of wetlands on this proposal. Chaplin's wetland setback is 100 feet, yet the buildable square of lots 10, 11, 12, 16, 17, 18, 19 and 20 actually enter the review areas. The buildable square on lot 10 falls lies within ±nine feet of the wetland boundary.

Wetlands themselves take up 10-20 percent of lots 8, 9, 10, 12 and 20; while 20-30 percent of lots 16-19, 21 is wetland. Lot 11 is comprised of nearly 40 percent wetlands!

By preserving each individual watershed as an entity, the cumulative effects on water quality townwide in the future will be remarkable. Likewise, the cumulative effects of unchecked, incremental impacts and neglect for the land use "rules" and best management practices will lead to water quality that will cost untold dollars to remediate in the long run, if they are ever repaired at all.

Wetland protection must be strongly advocated for in every development proposal that comes before the town.

Wildlife Habitat

Introduction

A site walk, development plans, and aerial photos were used to evaluate the existing wildlife habitat on the property. A Phase 1, 5-lot development had been approved and completed. The proposed development of Phase 2 contains approximately 42 acres and was recently approved by the town Planning and Zoning Commission in late October 2007. Approximately 23 acres of this approved subdivision will be set aside for open space. Of this, 14.5 acres is uplands and 8.5 acres is wetlands.

The main focus of this review is to evaluate the proposed development (the concept plan) of the remaining +160 acres. The concept plan proposes to subdivide the remaining area into approximately 50 lots, each of which will be just under two acres, along with the accompanying road system, driveways, wells and on-site septic systems. The total build out (including Phase 3) could contain +73 lots and a loop road with 3 cul-de-sacs.

Wildlife Resources and Wildlife Habitat

Wildlife habitat is said to be the complex of vegetative and physical characteristics that provide for all the requirements of wildlife, which is food, shelter, resting, nesting, cover, water and space. Generally, the greater the habitat diversity and degree interspersion of various habitat types, the greater the variety of wildlife there will be using the area. Obviously, the quality and types of habitat will influence the overall abundance and diversity of the species present. For example, while the presence of mowed lawn might by definition increase the habitat diversity in an area containing only forest, it would not serve to increase the quality of habitats, because mowed lawns have so little wildlife value.

On the other hand, though there may be fewer types of wildlife species overall, large unbroken expanses of one habitat type such as forestland provide extremely important habitat for many species including species that avoid edges. For example, some species of migratory birds (such as the ovenbird, cerulean warbler, and black and white warbler) need to nest in forest interiors at a certain distance from the edge in order to reduce their susceptibility to predators like raccoons, skunks, squirrels, and house cats, and nest parasitism by the brown headed cow bird, which is associated with agricultural landscapes. Other species require large areas of grasslands in which to nest, while still others need young stands of seedling/sapling forest or shrub lands. There are many factors to consider when determining habitat use and quality of an area for different species, including habitat types, size and quality of habitat types, overall size of the area, location, and degree of isolation, diversity, and juxtaposition with other neighboring habitat types. In general, wildlife need a variety of high quality habitats of sufficient size to ensure their conservation.

The 160-acre site is dominated by mixed hardwood forest, situated in a town that still remains chiefly rural in character and provides similar wildlife habitat in the neighborhood

and surrounding region. This site provides fair to good wildlife habitat since it is a fairly large area of forested wildlife habitat surrounded by other undeveloped forest, field and wetland habitats that can support a wide variety of wildlife. In general, larger areas of habitat can support more individual species of wildlife and more types of wildlife with larger home ranges, so they are considered more valuable to wildlife.

Existing Wildlife Habitats

Forest

The majority of this property is mature mixed hardwoods composed of oaks, hickories, birches, ashes and maples in the overstory. The understory has some diversity, but it is limited. Recent cutting has removed patches of trees and created openings in the canopy or overhead contiguous forest cover. While this is not favorable for those species requiring contiguous closed canopy, it has begun to create some regrowth of small sapling trees and herbaceous growth in some of the larger openings. While the forestry operation could have been undertaken in a manner that would have better optimized benefits for wildlife species that use young forest, some wildlife species that can use these small openings containing young forest growth and herbaceous plants like blackberry and raspberry will thrive as these areas grow in over the next 5 to 10 years. After 15 to 20 years, their value for these early successional-dependent species will greatly decline, as the growth will become too mature to be desirable to these species, yet not large enough to reach up and fill in the broken canopy cover to form unbroken mature forest cover.

Forested areas provide valuable wildlife habitat for hundreds of species, especially larger tracts of forests with well diversified understories that contain groundcover plants, saplings and young trees. Forests provide cover, food, nesting places, denning sites and roosting areas. Trees provide a variety of food in the form of nuts, berries, catkins, buds and browse. Trees, both living and dead (snag trees) serve as a home to a variety of insects, which in turn are eaten by many species of birds like woodpeckers, warblers and nuthatches. Trees with holes, dens or cavity trees, provide nest sites and cover for species such as raccoon, mice, wood duck, fisher, barred owl, flying squirrel and chickadee, to name just a few.

In addition to serving as habitat for a wide variety of well known birds and mammals, upland forest also serves as habitat for less visible and often overlooked reptile and amphibian species. For example, the common redback salamander spends its entire life cycle in upland terrestrial habitats in deciduous or coniferous forests or in openings under cover very close to forest patches. It breeds and deposits eggs beneath logs, under stones, inside rotten logs, and spends its adulthood under leaf litter.

Many other species of salamanders require temporary or vernal pools for breeding and then return to the surrounding forest to spend the balance of their time. That is why the connections between wetlands, vernal pools, and upland forests are so important. Forests are also home to a wide variety of invertebrates including moths, butterflies, beetles, borers, flies and a host of others.

Wetlands

The site contains forested wetlands, which will compose much of what is proposed to remain as open space. Forested wetlands are generally characterized by a high diversity of plant species and structural features that provide a host of feeding, breeding, nesting, over wintering and migration habitat for wildlife. Different assemblages of wildlife are found in forested wetlands depending on their site-specific characteristics, hydrology and location in relation to other habitats.

Red maples dominate in the wetland forested areas on the property with shrub species in the understory including highbush blueberry, arrow-wood and winterberry. These shrub species all produce berries that provide food for birds and small mammals. Herbaceous vegetation commonly associated with this habitat type includes cinnamon and sensitive fern, jewelweed and skunk cabbage.

Cavity and snag trees are typically plentiful in these wetland areas, due to the higher water table, which causes trees stress. Vernal pools can form in topographic depressions in forested swamps and wetlands. No vernal pools were noted during the inspection, but conditions were very dry and the inspection is only cursory. Surveys for vernal pools are best conducted during the spring or fall after rainfall events. Some species of wildlife such as the blue-spotted salamander and the wood frog are dependent on these vernal or temporary pools for successful breeding. The salamanders travel in mass migration to the pools where they were born in order to breed. Loss of these pools can eliminate entire breeding populations in

localized areas. Other wildlife species, including the spotted turtle, great blue heron, green heron, and garter snake are attracted to vernal pools because of the abundant prey that is found there. There are even some specialized species of obligate or vernal pool-dependent invertebrates. Tiny fairy shrimp only live in vernal pools and lay drought resistant eggs that hatch when the pools fill with water. Fingernail clams, and freshwater snails, are often found in the pools, as well as a variety of other mollusks, insects, and crustaceans. Vernal pools are very productive, valuable ecosystems that are often overlooked.

The soft hydric soils found in forested wetlands provide a good substrate for tunneling and burrowing for small mammals such as the red-backed vole, short-tailed shrew, white-footed mouse, and star nosed mole. These species feed on the abundant insects and herbaceous vegetation found in wooded wetlands and nest either in burrows or in the ground litter.

Early Successional Habitats

Early successional habitats are distinct habitat types that are produced by natural or man-made disturbances such as beaver activity, storm events, farming, forestry, etc. These habitats include hay fields, old fields, shrublands, beaver meadows, seedling/sapling stands, etc. These habitats have declined throughout Connecticut largely due to development, but also due to natural succession, intensified agriculture, and a disruption of natural disturbances across the landscape. With a decline in these habitats has come a decline in the species dependent on them, including the New England cottontail, ruffed grouse, woodcock, chestnut-sided warbler, golden-winged warbler, meadowlark and American kestrel.

There is just one small field on the property (<2 acres) that is composed of grasses and herbaceous plants. Because it is so small, it is not large enough to provide significantly important habitat by itself, but it does help to provide habitat for the generalist species like deer, turkey, chickadees, raccoons, white-footed mice, various insects and many other species, that would use it in conjunction with the other wetland and forestland habitats on site.

Open Space/Air Line Trail

Leaving 23 acres undeveloped for wildlife is helpful but it is not a very large area of habitat for the needs of most species. By itself, it will not satisfy the entire needs for food, water and cover on site, but will force species to travel to neighboring habitat to meet those requirements. Most of the open space will be wetlands, which, while valuable habitat alone, is much more valuable if connected to a variety of quality uplands including forestland. It is beneficial that the open space will be connected to other open space owned by the State of Connecticut and the Fin Fur and Feather Club via the Air Line Trail. The Fin, Fur and Feather Club is managed for recreational hunting and fishing and a variety of wildlife habitats. The State land is part of Natchaug State Forest system. Providing a buffer of open space along the Airline Trail will help to facilitate the movement of wildlife on and off the property. The buffer along the trail also provides for some aesthetic screening for those using the trail from the new homes to be built and vice versa.

State-listed Species

According to the Connecticut DEP Natural Diversity Database (Wildlife Division), records indicate that one threatened species, the Harris' checkerspot (*Chlosyne harrisii*), and two species of special concern, Horace's Duskywing (*Erynnis horatius*) and Whip-poor-will (*Caprimulgus vociferous*) occur in the vicinity of the project site. Please refer to the Natural Diversity Data Base section for specific habitat preferences of these species and DEP Wildlife Division recommendations.

Recommendations for Reducing Wildlife Habitat Impacts From Development

As the amount of development on the site increases, the habitat value for wildlife proportionally decreases. This is because development changes forests, fields, and wetlands into house lots, lawns, roads, and filled areas. If the impacts are not direct, such as conversion from forest to a lawn, they are often indirect such as when forest is fragmented by house lots causing increased predation to those species (especially forest dwelling birds) trying to nest in what may have been interior forest a short time ago. Other non-direct impacts include increased disturbance from humans, roaming cats and dogs, polluted runoff and introduction of non-native species in landscaping. Some species of wildlife will not tolerate the habitat changes and increased human activity and others species, more tolerant or even attracted to these changes may increase in the area and become a nuisance. These would include species such as skunks, raccoons, moles and coyotes.

Short of not developing the area, reducing impacts to wildlife can only be done incrementally. Probably the most significant way to reduce impacts to wetlands and wildlife habitat would be to eliminate the loop road configuration that would join Phases 2 and 3 and just end road construction with two dead end cul-de sacs. This would eliminate a major wetland crossing, reduce the length of total road needed and would eliminate further fragmentation of the proposed open space.

There are several management guidelines that can be considered during the planning process to help minimize impacts to wildlife during development:

1. Make use of natural landscaping techniques (avoid and/or minimize lawns and chemical applications) to lessen acreage of lost habitat and possible wetland contamination.

2. In general, try and leave as many of the natural trees as possible during land clearing, as these will be most beneficial to wildlife and aesthetically pleasing to people.

3. Maintain a 100-foot wide buffer zone of natural vegetation around wetland/riparian areas to help filter and trap silt and sediments, if development must occur near them. These vegetated zones provide excellent wildlife cover and travel corridors.

4. A minimum buffer of at least 750 feet is required around vernal pools to maintain their minimal value to the animals dependent upon them for breeding.

5. According to the best science available, a buffer of at least 750 feet from wetlands into uplands is needed to somewhat reduce the impacts to reptile and amphibian species using the upland forest area in conjunction with the wetland.

6. Encourage planting to native trees and shrubs valuable to wildlife. Lists are available upon request.

7. Stone walls should be maintained if possible because they provide outstanding wildlife cover. Trees and shrubs along stone walls should also be maintained if possible to provide food and cover.

8. During land clearing care should be taken to maintain certain forestland wildlife requirements whenever possible including,

    a. Encourage mast-producing trees (oak, hickory, beech).
    b. Leave 3-5 snag/den trees per acre as they are used by many birds and mammals for nesting, roosting and feeding.
    c. Exceptionally tall trees are used by raptors as perching and nesting sites and should be left.
    d. Brush piles should be created and left behind if possible.

e. Trees with vines (for fruit production and cover) should be encouraged.
f. Removal of dead and downed woody material should be discouraged where possible. This material is important habitat for salamanders, small mammals and the insects they feed on.

Summary

Further development of this area will reduce its value for wildlife in direct proportion to the amount of development that occurs; the more development, the less valuable it will be for supporting a diversity of native wildlife species over time.

References

Askins, Robert A., Bertin Robert I., and Clark, Jr. George A. The Atlas of Breeding Birds Of Connecticut. Hartford: The technical publications Program of the Department of Environmental Protection, 1994.

Opler, Paul A., Harry Pavulaan, Ray E. Stanford, Michael Pogue, coordinators. 2006. Butterflies and Moths of North America. Bozeman, MT: Mountain Prairie Information Node. http://www.butterfliesandmoths.org/ (Version 11/29/2007).

Reese, Mike. "Wisconsin Butterflies: Horace's Duskywing ". 11-29-2007 <http://www.wisconsinbutterflies.org/butterflies/species/214>.

Pedevillano, Cathy. 1995. Habitat Values of New England Wetlands. Concord, NH. U.S. Fish and Wildlife Service. New England Field Offices.

The Natural Diversity Data Base

The Natural Diversity data Base maps and files regarding the project area have been reviewed. According to our information, there are records for State Threatened *Chlosyne harrisii* (Harris' Checkerspot) and Special Concern species *Erynnis horatius* (Horaces's Duskywing) and *Caprimulgus vociferous* (whip-poor-will) from the vicinity of this project site.

The Harris' Checkerspot butterfly is found in moist areas like marshes, bog edges, pastures and meadows. The host plant is flat-topped white aster (*Aster umbellatus*). The adult female lay eggs in clusters under host plant leaves. The caterpillars feed on leaves communally in a web and partially-grown caterpillars hibernate at the base of the host plant.

The Horace's Duskywing butterfly is more restricted to xeric rocky areas and barrens north of southern New Jersey. The caterpillars feed on young leaves and rest in leaf nests. They can produce two broods per year and the caterpillars of the last brood hibernate. The host plants include both the red and white oak and scrub oak. The adults will feed on dogbane, buttonbush, goldenrod, peppermint and winter cress.

Whip-poor-wills are ground nesting birds that favor mixed hardwood forests. It is considered a neotropical migrant, nesting in Connecticut from late May through July and wintering in South America. Cutting and/or clearing of open woodlands can reduce habitat for this species. If work is done outside of the breeding season, the potential for destruction of nests, eggs, or young is reduced. Jenny Dickson (860-675-8130) can further assist you on this project's impact on the whip-poor-wills.

www.mbr-pwrc.usgs.gov

The invertebrate species have been negatively impacted by the loss of their associated plant species and habitats. If favored plants are going to be impacted by this project these species may be affected. The DEP Wildlife Division recommends that a lepidopterist conduct surveys for these species. A report summarizing the results of such surveys should include habitat descriptions, invertebrate species list and a statement/resume giving the lepidopterist' qualifications. The DEP does not maintain a list of qualified lepidopterists in the state. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

Please be advised that the Wildlife Division has not made a field inspection of the project site nor have they 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 any 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 additional questions please contact Julie.Victoria@ct.gov, and reference the NDDB #15760.

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

Attributes of *Erynnis horatius* (Horace's Duskywing)


female (upperside) ©Lori M. Wilson
Horace's Duskywing

Family: Skippers (*Hesperiidae*)

Subfamily: Spread-wing Skippers (*Pyrginae*)

Identification: Fringes are brown. Upperside of male forewing is dark brown with little contrast and no white overscaling. Upperside of female forewing is light brown with a contrasting pattern and large transparent spots. Underside of hindwing is usually without 2 spots below the apex. Male has a costal fold containing yellow scent scales; female has a patch of scent scales on the 7th abdominal segment.

Life history: To seek females, males perch at the ends of twigs on hilltops or slopes about 1 foot above the ground. Mating has been observed around midday; females deposit eggs singly on new growth of the host. Caterpillars feed on young leaves and rest in leaf nests. Caterpillars of the last brood hibernate.

Flight: Two broods in the north from April-September, three broods in the Deep South and Texas from January-November.

Wing span: 1 7/16 - 1 15/16 inches (3.6 - 4.9 cm).

Caterpillar hosts: Both red and white oaks including willow oak (Quercus phellos), northern red oak (Q. velutina), scrub oak (Q. ilicifolia), water oak (Q. nigra), post oak (Q. stellata), and live oak (Q. virginiana).

Adult food: Horace\'s Duskywing visits flower up to about 4.5 feet tall including dogbane, buttonbush, sneezeweed, goldenrod, peppermint, boneset, and winter cress.

Habitat: Open woodlands and edges, clearings, fencerows, wooded swamps, power-line right-of-ways, open fields, roadsides.

Range: Massachusetts west to eastern South Dakota; south through most of the eastern United States to Florida, the Gulf Coast, and South Texas; south in the west through southeastern Utah, Colorado, northeastern Arizona, and New Mexico.

Conservation: Not usually required.

NatureServe Global Status: G5 - Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Management needs: None reported.

Opler, Paul A., Harry Pavulaan, Ray E. Stanford, Michael Pogue, coordinators. 2006. Butterflies and Moths of North America. Bozeman, MT: NBII Mountain Prairie Information Node.
http://www.butterfliesandmoths.org/

Attributes of *Chlosyne harrisii* (Harris' Checkerspot)

Family: Brush-footed Butterflies (*Nymphalidae*)

Subfamily: True Brushfoots (*Nymphalinae*)

Identification: Upperside is orange with black markings. Underside of hindwing has a red-orange stripe at the margin and a red-orange, white, and black checkered pattern on remainder of wing.

Life history: Females lay eggs in clusters under host plant leaves. Caterpillars feed on leaves communally in a web. Partially-grown caterpillars hibernate at the base of the host plant.

Flight: One brood from June-July.

Wing span: 1 7/16 - 2 inches (3.6 - 5.1 cm).

Caterpillar hosts: Flat-topped white aster (Aster umbellatus).

Adult food: Flower nectar.

Habitat: Moist areas such as marshes, bog edges, pastures, and meadows.

Range: Maritime Provinces west to Manitoba, south to West Virginia, southern Ohio, and northeastern Illinois.

Conservation: Not usually required.

NatureServe Global Status: G4 - Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.

Management needs: None reported.

Opler, Paul A., Harry Pavulaan, Ray E. Stanford, Michael Pogue, coordinators. 2006. Butterflies and Moths of North America. Bozeman, MT: NBII Mountain Prairie Information Node.
http://www.butterfliesandmoths.org/

Trail and Greenway Development

Potential for Recreational Trail Development

This property abuts the Airline State Park Trail (ASPT) and as such provides an excellent local linkage opportunity. Establishing a trial system and designating recreational uses will curtail future residents of the subdivision from potentially creating multiple unplanned links and so may help prevent unknowing abuse of any sensitive resources.

The regional high school, located on the opposite side of Parish Hill Road from the proposed subdivision provides an excellent opportunity to design a link through the proposed subdivision to the ASPT and providing an alternative mode of transportation for area students. This could also provide the basis for development of a "Safe Routes to School" (SRTS) program if one does not already exist.

Connecticut SRTS Program

Managed by the Connecticut Department of Transportation (DOT), Connecticut's federally funded Safe Routes to School (SRTS) program is the source for state coordinator contact details, federal SRTS funding amounts, SRTS applications and guidelines, and state SRTS program information.

Connecticut DOT SRTS Coordinator

Sharon Okoye
(860) 594-2367
Sharon.Okoye@po.state.ct.us
http://www.ctsaferoutes.org/

If they are interested in pursuing trail development, this reviewer would encourage the Planning and Zoning Commission to work with their parks department and the CT DEP Eastern District Manager to determine how such a trail(s) could bring recreational/alternative transportation assets to the town while protecting any identified sensitive natural resources. CT DEP Recreational Trails Program Grants are a potential funding source for the development of this trail link to the ASPT.

National Recreation Trails Program

The Recreational Trails Program (RTP) is an assistance program of the U.S. Department of Transportation's Federal Highway Administration. RTP is administered through the Connecticut Department of Environmental Protection (DEP). Recreational Trails Program funds may be used for:

- Construction of new trails (motorized and non-motorized).
- Maintenance and restoration of existing recreational trails (motorized and non-motorized).
- Access to trails by persons with disabilities.
- Purchase and lease of trail construction and maintenance equipment.
- Acquisition of land or easements for a trail, or for trail corridors.
- Operation of educational programs to promote safety and environmental protection as related to recreational trails.

DEP may award grants to private nonprofit organizations, municipalities and state departments. Sponsors may submit proposals for any of the permitted uses as listed. Grant amounts vary. **These are reimbursement grants, with a federal share limited at 80% of the total project cost. Project sponsors must incur cost for work actually completed, and then submit vouchers to DEP for payment. No payment can be made for work done prior to a fully-executed grant agreement.** A project sponsor should tailor the project so that the project moves quickly into implementation after project approval. Projects must be reviewed to avoid any negative impact to the State's natural, cultural and historic resources. Grants may be delayed or denied if such impact is detected.

Proposals are solicited annually for trail related projects. Proposed projects must have funding available and be located on land open to the public. Necessary permits and easements, if needed, must be in place prior to beginning the project. **A request for proposals will be announced in June 2008 for federal fiscal year 2009 funding. The deadline for proposals will be September 2008. Awards will be announced in November 2008 and funding should be available in January 2009.** If you have any further questions please feel free to contact Laurie Giannotti at (860) 424-3578 or by email at laurie.giannotti@po.state.ct.us.

A downloadable RTP Application is available – www.ct.gov/dep/rectrails

Greenways Potential

As shown on the map provided in our packet, there is a Natural Diversity Database (NDDB) area of concern located in the eastern corner of the property. The CT DEP geographic information system indicates that more than half of the property is contained within the headwaters of a public water supply watershed. The property is currently forested and contains large wetland areas.

Large existing open space exists to the east, south and west of the property that together with the properties open space contributes to a developing regional greenway. NDDB issues, public water supply protection, wildlife and forestry significance should be well understood

and incorporated into the sites dedicated open space. In addition to the information contained in this ERT, the Planning & Zoning Commission may wish to work with the Windham Council of Governments and the Quinebaug-Shetucket National Heritage Corridor to help the town understand and incorporate the property regionally.

CT DEP is currently reviewing the potential to accept ownership of the open space. It is critical that the residents of the subdivision understand what sensitive species and natural resources/habitats exist in the open space and that they are enlisted to participate in open space management. Participation of the residents can curtail illegal dumping and degradation of the open spaces. Neighbors such as the abutting hunting club to the west and the high school should be consulted and possibly involved in open space management. In particular, high school science programs could participate in open space quality monitoring. There may be opportunities for forest management; to this end the UConn Cooperative Extension Foresters can be a good partner. The Conservation Commission or an area land trust would also be natural partners.

Planning Considerations

The development parcel is the largest unprotected parcel of land in the Town of Chaplin. It is strategically important for conservation purposes because it contains over 4,000' of frontage along the Airline Trail North, a CT State Greenway. Phase II of the Kimball Woods Subdivision has already been approved by the Chaplin Planning and Zoning Commission. The following comments will address the future development of the remaining land.

Traffic and Access

The development parcel is located on Parish Hill Road, a local road in Chaplin. No average daily traffic information is available for this road. It is not anticipated that the development proposal will have a significant impact on traffic in the vicinity; however increased traffic on local roads will create a change in character and cause the road surface to age more quickly.

The proposed vehicular access for future phases of development within the Kimball Woods Subdivision is a loop road connecting the end of the Phase II cul-de-sac with Parish Hill Road. This proposed intersection has insufficient lines-of-sight for drivers on Parish Hill Road. Extensive realignment of Parish Hill Road will be required of the applicant if future phases are formally proposed.

In future phases of development, access to the Airline Trail North should be provided for residents of the Kimball Woods Subdivision in the form of a narrow path or walking trail. This access should include two common ownership rights-of-way originating from the cul-de-sacs, one on either side of the wetlands crossing, and terminating at the Airline Trail North.

Consistency with State Plan

The site is designated as "Preservation Area", "Conservation Area", and "Rural Lands" in the *State Plan of Conservation and Development, 2005-2010.* Preservation Areas should be managed as no-build areas. No development has been proposed in these areas. In Conservation Areas, some development may occur if it is in a form that is compatible with the resource to be protected. About one half of the entire development parcel is within the Willimantic Reservoir Public Water Supply Watershed. All of the Phase II development is within this watershed. The remainder of the property is identified as Rural Lands. The general policy for Rural Lands is that development occurring in these areas should meet the community's design and engineering standards and be consistent with historic rural character and natural resource values, while adequately meeting public health and safety concerns.

Consistency with the Regional Plan

The site is designated as "High Priority Preservation Area" (corresponding with the state's "Preservation Area"), "Priority Preservation Area" (corresponding to the state's "Conservation Area"), and "Rural Conservation Area" (corresponding to the state's "Rural Lands") in the *Windham Region Land Use Plan 2002*. Additionally, the High Priority Conservation Areas are also identified in the regional plan as potential Historical Resource areas.

The development parcel is not in an area recommended for development. The general policy is that structural development is more appropriately located in other areas. For development that does occur in these areas, the following conservation values should be applied:

a. Conservation of natural resources such as productive forest and farmland soils,
b. Creation of the least possible impact on the existing topography and vegetation,
c. Contribution to rural character by either blending with traditional rural structures and development patterns or by using existing topography and vegetation to create the least visible presence on the landscape.
d. Creation of open space linkages to maintain wildlife corridors and trail connections.

The regional plan also promotes the adoption of cluster subdivision regulations that provide strong incentives to reduce lot sizes while maintaining density and conserving open space.

Consistency with Chaplin Plan of Conservation and Development

The *Chaplin Plan of Conservation and Development* recommends requiring the retention of existing stone walls. The proposed lot boundaries completely bisect and disregard existing stonewalls on the property. Future development should utilize existing stonewalls as property boundaries in order to preserve them and retain rural character.

The plan recommends through roads as opposed to long cul-de-sacs, especially in large wooded tracts such as this parcel. Future development should convert the existing cul-de-sac to a through road because this will reduce traffic impacts and create a logical public street network. The town should not accept any cul-de-sacs as town roads but rather, permit them only as private streets. Short cul-de-sacs may be permitted but common driveways are the recommended method of access.

Consistency with Chaplin Open Space Subdivision Design Criteria

The Phase II design fails to use common driveways and rear lots as a method of achieving a clustered design. The Phase II design also doubles the front and rear yard setbacks and artificially increases the distance between houses, thereby circumventing the clustered design that is intended under the Town's regulations. In the future, subdivision lots on this parcel should be arranged to minimize lot area and include common driveways and rear lot stacking in order to minimize disturbance to the natural topography and to maintain the rural character of Parish Hill Road.

Overview

Overall, the Kimball Woods Subdivision Phase II is incompatible with the conservation and development goals outlined in state, regional and local plans as well as the design goals of open space subdivisions. By using the recommendations contained in this report, future developers of the remaining land have an opportunity to achieve a more sustainable, compatible and efficient subdivision design.

Appendix

Chaplin Planning and Zoning Commission Minutes 10/24/07

Planning and Zoning Commission
October 24, 2007
Work Force One Building
(next to Chaplin Public Library)
7:00 PM

Public Hearing

7:00pm. Continuation of Public Hearing on a 14 lot Open Space Conservation Subdivision Plan for Kimball, Woods Phase II by Spring Valley LLC of Mansfield Ctr ,CT, for property located on Parish Hill Road in Chaplin., map #93 Parcel 63 and Map # 00 parcel 1.

The continuation of the hearing was opened at 7:08 pm. Members present: Raymond,Godaire, Garceau, Meyer,Peifer,and Howard. Mr. Hearly presented responses to the comments provided by Towne Engineering date October 17th, 2007. Mr. Randazzo and Attorney Schrager were also present. The hearing was closed at 8:26pm. The hearing was recorded on digital media.

Special Meeting

Call to Order The special meeting was opened at 8:28 pm. Members present were Raymond,Godaire,Garceau,Meyer, Peifer and Howard.

Seat Alternates. Peifer was seated from Bruckerhoff, and Howard for Kegler

.**Old Business**

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1. Discuss and act on Kimball Woods Phase II Open Space Subdivision

Meyer moved and Garceau seconded a motion to approve Phase II of the Kimbal Woods 14-lot Open Space Subdivision for property owned by Spring Valley LLC with a dedication of approximately 23.3 acres of open space on 42.3 acres located Parish Hill Road in Chaplin with the following conditions:

a).The applicant and the commission will draft an acceptable dedication of open space with a conservation easement an restriction per section 5.12.5.e allowing for the conditions under 5.12 section 9.o-v

b). provide access for governmental officials and suitable language allowing access by others for environmental monitoring of resources in the open space. Within 3 years, reconsider public access if land still held in trust by the developer.

c).Reserve the option to dedicate the land to the State of Connecticut, the Town of Chaplin or a suitable land trust in the future.

d). The applicant will comply with all remaining requirements in the Subdivision regulations including but not limited to: issues with common driveways in section 6.05 listed in parts 4c and 4e; marking of boundaries for the open space; submission of final digital subdivision plans in AutoCAD format per section 3.03.

e. The Quit Claim deed for establishing the street line of Parish Hill Road should be provided for review as a condition of approval prior to the filing of the mylars for the subdivision.

f. The applicant will provide $353,000 Public Improvement Bond with applicant providing $10,000 in cash to cover any road damage or E&S measures that the town may need to respond to with the balance of $343,000 to be provided in the form of a commercial surety in a vehicle approved by the town attorney.

g. The applicant will provide a cash amount of $5,000 to be deposited with the Town prior to the start of construction and that amount be maintained until the satisfactory completion of the road construction proposed with the Developer being invoiced monthly for the expenses incurred by the Town. The Town will account for any expenditures required and the remainder of any unspent funds to be returned to the applicant. Any expenditures in excess of the $5,000 will be billed monthly to the applicant by the Town.

h. Applicant will add a temporary 30 ft easement adjacent to lot 14 to provide access to the open space for town and state officials.

Motion passed with 5 voting yes. Mr. Godaire recused himself from the deliberations

Adjournment Meyer moved to adjourn at 8:50 pm

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.