

Paddock Ridge Subdivision Naugatuck, Connecticut



King's Mark Environmental Review Team Report

**King's Mark Resource Conservation & Development Area, Inc.
Paddock Ridge Subdivision**

Naugatuck, Connecticut



Environmental Review Team Report

Prepared by the
King's Mark Environmental Review Team
Of the
King's Mark Resource Conservation and Development Area, Inc.

For the
Inland Wetlands Commission
Naugatuck, Connecticut

April 2010

#354

Acknowledgements

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

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

The field review took place on Wednesday, February 24, 2010.

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I would also like to thank Keith Rosenfeld, town planner, Naugatuck, Wayne Zirolli, town engineer, Naugatuck, Jeff Hayden, inland wetland commission member, Manuel

Vieira, applicant, George Cotter, engineer, OCC Group, 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 maps. During the field review Team members were given additional information. Some Team members conducted a map review only. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

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

The King's Mark RC&D Executive Council hopes you will find this report of value and assistance in reviewing the Paddock Ridge Subdivision.

If you require additional information please contact:

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Introduction

Introduction

The Naugatuck Inland Wetlands Commission requested Environmental Review Team (ERT) assistance in reviewing a proposed subdivision.

The 14.79 acre site is located in the northwest section of Naugatuck at the end of King Street adjacent to Larkin State Park Trail. The proposed subdivision is for 13 single family lots in an R-30 Zone with lots ranging in size from .70 acres to 2.39 acres. The lots will be served with public water and sewer. King Street will be improved and extended to the state property (it was approved under a separate permit application). One new cul-de-sac road is proposed and a detention basin.

The site is presently wooded with 2.34 acres of wetlands, and 4.5 acres of conservation easement. Barber Pond, also known as Tarzan Pond, is a privately owned waterbody located directly to the east. The town has a 100' upland review area from wetlands.

Objectives of the ERT Study

The ERT has been requested to assist the town in the review of the project because of concerns with the following issues: potential impacts from erosion and methods of sediment control, potential effects of stormwater management strategies, potential impact of proposed road, impacts to wildlife habitat, and potential impacts to existing watercourses and waterbodies and aquatic habitats.

The ERT Process

Through the efforts of the Naugatuck Inland Wetlands Commission this environmental review and report was prepared for the Town of Naugatuck.

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

The review process consisted of four phases:

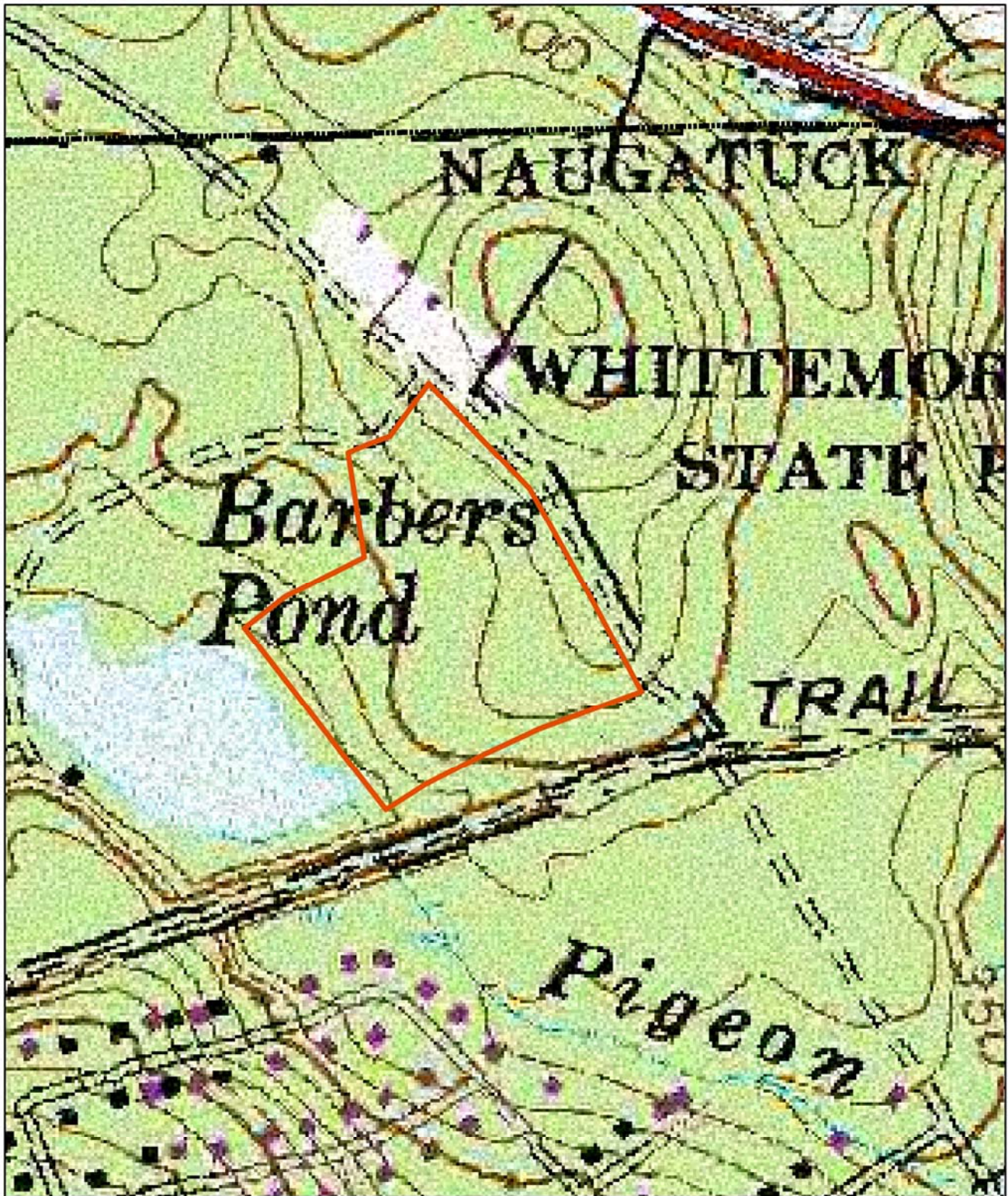
1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted Wednesday, February 24, 2010. Team members also made individual or multiple field visits. The emphasis of the field review was on the exchange of ideas,

concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

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

Paddock Ridge Site Map



The Connecticut Environmental Review Team



This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team. This map is for educational use only. It contains no authoritative data. February 2010.



Naugatuck, CT



Paddock Ridge Aerial Map



The Connecticut Environmental
Review Team



This map was prepared by Amanda Fargo-Johnson for
the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
February 2010.



ERT Study Area

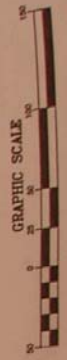
Naugatuck, CT





POINT	ELEVATION
1	432.00
2	431.50
3	431.00
4	430.50
5	430.00
6	429.50
7	429.00
8	428.50
9	428.00
10	427.50
11	427.00
12	426.50
13	426.00
14	425.50
15	425.00
16	424.50
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89	388.00
90	387.50
91	387.00
92	386.50
93	386.00
94	385.50
95	385.00
96	384.50
97	384.00
98	383.50
99	383.00
100	382.50

BENCHMARK:
PK NAIL IN 18" TWIN OAK
Elev. 432.00 (Field Set
From USGS Datum)



Topography and Geology

The proposed Paddock Ridge subdivision is located on a southwest facing slope of a rounded hill in northern part of Naugatuck. The relief is generally rather gentle: moderate slopes are found only along the border of the pond on the west and along part of the southern boundary of the parcel. The hill is covered by a thin veneer of rocky glacial till (soil).

The area is underlain by the Waterbury Gneiss, which crops out just south of the property on land owned by the State of Connecticut (see Figure 1a and 1b). The Waterbury Gneiss is gray and dark gray gneiss and schistose gneiss. It had a distinct foliation (layering) that is caused by compositional bands containing variable amounts of biotite mica. Bands (layers) with abundant mica become schistose and are dark gray. Bands with less mica contain proportionately more plagioclase feldspar and quartz and are light gray. Some of the plagioclase rich layers are coarse grained and considered pegmatitic. (Pegmatite: A very coarse grained igneous rock, normally of granitic composition. Typically forms during the final states of [magma chamber](#) crystallization when the high water content solutions allow rapid crystal growth.) The foliation of the gneiss dips (is tilted) steeply toward the west-southwest. Because the area is located on the southwest side of the Waterbury Dome, the regional foliation dips toward the southwest. Locally unfoliated pegmatite cuts across the gneissic foliation. The host rock is locally rusty weathering at some of contacts with unfoliated pegmatite (Figure 1c). The cause of the rusty weathering was not determined during the field visit. It may be caused by small amounts of iron-sulfide minerals deposited at the contact. If this is the case, care should be exercised when using blasted bedrock spoils for fill on the property, especially near Barber's Pond (a.k.a. Tarzan Pond).



A. **B.** **C.**
Figure 1. Waterbury Gneiss underlies. It consists of gray and dark gray banded gneiss. A. Outcrop south of parcel dips steeply toward the west-southwest. It consists of dark gray gneiss with irregular pegmatitic masses. B. Glacial boulder on property illustrates banded nature of gneiss. Light bands are weakly-foliated, pegmatitic, plagioclase gneiss. C. Rusty weathering adjacent to unfoliated pegmatite.

Soil thickness is greater than 8' in much of the area. Two conflicting data sets, based on digging two sets of test pits in 1989 and 1994, in general show the soils to be between 4.5 and greater than 8' in depth. The operator digging test pits in 1989 was able to penetrate deeper in most locations than the operator digging pits in 1994. The deeper value is

considered reliable; shallow values (1994) are considered to have encountered boulders. Figure 2 shows areas with shallow bedrock (ledge) beneath lots 4-6 and 10-13. In addition, an outcropping of ledge was observed on the south slope on state property opposite Lots 11 and 12. Bedrock is mostly biotite plagioclase gneiss. It will be encountered in some areas when digging foundations and utility (especially sanitary) trenches. The Waterbury Gneiss is “hard” and will likely require blasting. The spoils most likely can be used for back filling, but should be checked for the presence of sulfide minerals. Sulfide minerals leach out of the broken rock producing iron oxide (rust) and acidic leachate (H_2SO_4) and could adversely affect the nearby aquatic habitat.

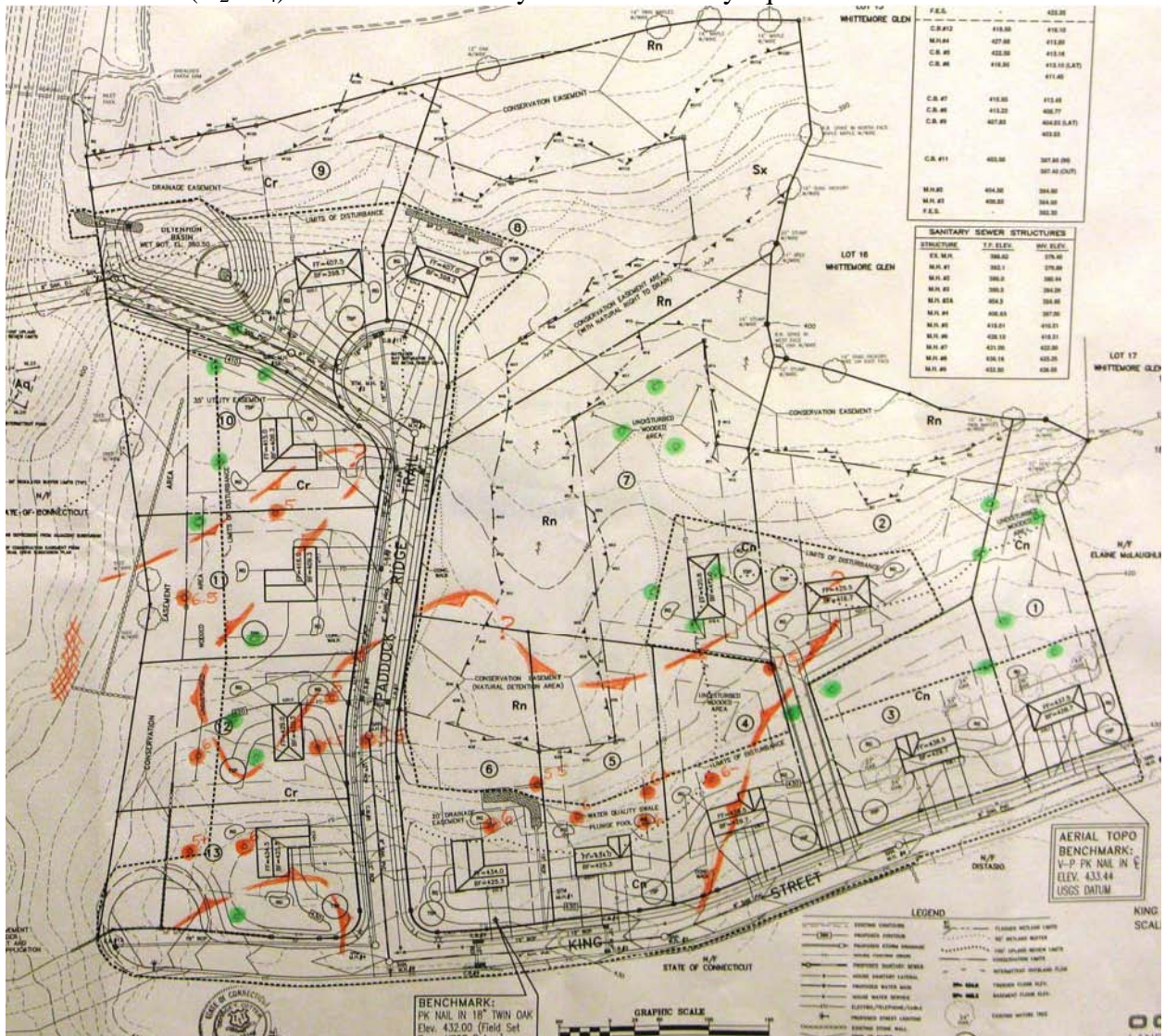


Figure 2. Map showing area where bedrock (ledge) is close to the surface based on test pits dug in 1989. North direction is toward right as map is oriented. Test pit locations approximate (transferred onto this map by the reviewer) and several pits located on west side of parcel (top of map) were omitted. Test pits shown in orange encountered ledge; those shown in green did not encounter ledge. Most test pits that did not encounter ledge were dug to a depth of 7'. Approximate location of outcropping of ledge (shown as orange cross-hatching) is south of lots 11 and 12 (see Figure 1a) on land belonging to the State of Connecticut.

The soils are generally rocky or very rocky. The soil was left behind (glacial till) when the last ice-age glacier melted. The small wetland that bisects the property in an east-west direction has rocks in amounts far greater than adjacent soils (Figure 3A). Furthermore, many of the stones in this wetland are oriented in such a way that they tilt upstream (Figure 3B). Deposition by glacial meltwater streams could account for these observations. The meltwater was constrained by banks of left-over ice. The finer fraction of the till deposit already there was washed out and additional stones were washed in. Modern fast moving streams deposit flat stones on top of one another like shingles. It is likely that the glacial stream did the same.



A.

B.

Figure 3. A. Concentration of stones in wetland (left side of image) compared to slightly higher areas (center and right). B. Stones in wetland are rounded and oriented. Pink arrows show tilt direction of individual stones (see text).

Southwest Conservation District Review

This soil resources report applies to the 14.79-acre parcel referred to as the Paddock Ridge Subdivision parcel, which is bounded by Barbers Pond to the west, southwest by the Bridal Trail, north by Michael Lane and King Street to the east. The information in this report is based on the USDA's historical soils series descriptions and the new digital mapping unit descriptions as presented in the Soil Survey of Connecticut, remote survey interpretations plus field observations.

Soils Resources

Exhibit #1 Soils Map, Exhibit #2 (Dwellings with Basements) & Exhibit #3 (CT Hydric Soils Mapping) are derived from the new digital survey (Soil Survey of Connecticut). The soil survey utilizes recent aerial photographic base with one soil legend, which employs the numbering convention used by the USDA.

Wetland Soils

USDA Soil #3-RN–Ridgebury, Leicester and Whitman extremely stony fine sandy loams. Consists of nearly level to gently sloping, poorly drained soils in drainageways and depressions on glacial uplands. Ridgebury soils are very deep and derived mainly from gneiss and schist. Typically, they have a friable loam or fine sandy loam surface layer and subsoil over a firm fine sandy loam or sandy loam dense till substratum. Ridgebury soils have a perched watertable within 1.5 feet of the surface much of the year.

Non-wetland Soils

USDA Soil #52C-SxC–Sutton extremely stony fine sandy loam, 3 to 15 percent slopes.

These soils are very deep and moderately well drained. They have developed in slight depressions on glacial till plains and near the base of slopes on glacial uplands where the relief is affected by underlying bedrock. Typically, Sutton soils have fine sandy loam textures to a depth of 60 inches or more. Depths to the seasonal high watertable range from 1.5 to 2.5 feet during the months of November to April. Redoxamorphic (mottles) features occur within a depth of 24 inches.

This soil has a fair potential for community development. Proposed structures with basements require careful design due to the basements being below the depth of the watertable. If not constructed properly, the structures integrity can be compromised. Waste disposal systems, such as on-site septic systems generally will not function satisfactorily with normal design and installation because of the seasonal high watertable. This soil will remain wet and soggy for several days after moderate to heavy rain events.

USDA Soil #62C-CnC– Charlton extremely stony sandy loam, 3 to 15 percent slopes.

Charlton soils are very deep, well-drained soils formed in glacial till, derived mainly from granite, gneiss and schist. Typically, they have a fine sandy loam surface layer and subsoil over a friable fine sandy loam or sandy loam substratum that extends to a depth of 60 inches or more. This soil has fair potential for development.

This soil is limited by stoniness and steepness of slope. Permeability is moderate to moderately rapid. Runoff is medium to rapid. The hazard of erosion is moderate to severe. The steepness of slope attribute is significant during any proposed construction activity that is in such close proximity to wetlands and watercourses. Careful attention should be given in minimizing disturbances, employing enhanced erosion and sedimentation controls and maintaining adequate vegetated buffering of sensitive areas.

USDA Soil #73C-CrC– Charlton-Hollis soil types with slopes ranging from 3 to 15 percent.

This complex consists of well drained soils located on uplands where the relief is affected by underlying bedrock. The Charlton component has moderate or moderately rapid permeability. Runoff is medium to rapid. The Hollis component has moderate to moderately rapid permeability above the bedrock.

This complex has fair to poor potential for community development. The Charlton component has fair potential for development and the Hollis has poor potential for development due to its shallowness to bedrock.

Intensive enhanced conservation measures such as temporary vegetation and siltation basins are frequently needed to prevent excessive runoff, erosion and siltation.

Concerns

The included Paxton and Hollis soils are even less suitable for development: Paxton soils have slow permeability in the substratum. A dense lense of Paxton soils within the Charlton soil can cause down slope seeps and affect the structural integrity of proposed service infrastructures and dwellings.

Hollis soils are limited by their shallowness to bedrock, which is approx. 10 to 20 inches in depth.

The fine particulates of schist and gneiss associated with these soils stay in suspension for extended periods. This characteristic demands adequately sized temporary and permanent sedimentation basins to assure runoff pretreatment and minimize the potential for transport of solids and turbid water off-site.

All of the aforementioned non-wetland soils are easily suspended and transported by surface runoff. The minimization of land disturbance, avoiding or limiting exposure of steep slopes is important during all phases of construction.

Erosion and Sedimentation Control

(See Exhibit #4)

The Erosion Control Plan is inadequate to control this site.

1. Narrative: - The narrative should include reference to the NPDES Stormwater Permitting requirement and indicate compliance with the new Phase II permitting process under construction activities.

Stand Alone Document - The E&S Plan, Narrative and Details should be developed so they can be separated from the overall site plan (which includes the construction drawings. E&S plans can be integral with the site plans in smaller projects with limited natural resource issues. The proposed disturbance of highly erodable land in such close proximity to wetlands and waterbodies warrants a more detailed E&S plan.

2. SWPPP – Phase II Stormwater Pollution Prevention Plan - Drawing details and locations of equipment staging, refueling and hazardous materials storage with 125% spill containment capabilities need to be addressed in the Phase II requirement.

Note: Refueling and staging should be located away from sensitive habitats and shown on the field of the drawing of the SWPP or a version of an enhanced E&S drawing.

Sequencing

- Sequencing of major operations within the phases. Phasing is critical in controlling this site due the sites physical attributes and natural resources.
- A legend to identify all measures and facilities employed in the construction process that utilizes the standard coding system should be employed.

General Permit; Section 6 – Conditions of General Permit – paragraph 6-(B)
“Wherever possible, the site shall be phased to avoid the disturbance of over 5-acres at one time. The Plan shall clearly show the “limits of disturbance” for the entire site used for each phase”. Scaling the site plans provided the District; the estimated land disturbance is approximately 7.2-acres. In an effort to insure that the E&S Controls are not outpaced by the land disturbance, the proposed project should be phased so that no more than five (5)–acres are disturbed at one time with 90% stabilization obtained before moving on to the remaining acreage.

Erosion and Sedimentation Control Measures

The standard E&S measure coding system is not fully employed on the field of the drawing. The site plans would benefit by its implementation in providing uniformity of plans, clarity and the simplification of the plan.

1. Construction Entrance (CE) – Due to the soil types, enhance the anti-tracking measures by increasing their length of the entrance to 75 feet and utilizing the CE as a wash-down area.

2. Temporary Sedimentation Basins (TST) - Generally, the location of the permanent basins are utilized for the temporary sediment traps. However the TST's need to be adequately sized in order to deal with the **higher amount of exposed acreage during the construction activity**. Temporary or permanent diversions are also needed to convey runoff to these strategically placed TST's.

Note:

- Size TST's for 134 cu/yds of storage capacity per acre during the construction phase. Permanent sedimentation basins are installed and designed to treat runoff from a post construction condition, which leads to the basin being inadequate in size and storage capacity. The permanent basins outlet control structures then act as a direct conveyance for the introduction of contaminated water to the wetlands and waterbodies on and off-site.
- Periodic maintenance of the TST's is important in optimizing their performance. This installation of riprap in the TST bottom is not recommended, because it impedes the removal of solids.
- TST's should either be located and detailed on the field of the drawing with their individual storage capacities noted or numbered on the field of the drawing and reference a tabulated size / capacity schedule in the E&S detail drawing packet.

3. Diversions (WB, TD, PD, SCD)

- **WB** - Temporary Roads and Driveways longer than 60' would benefit from the installation of water bars that reduce the volume of concentrated flows and redirect surface water runoff to nearby vegetated areas for infiltration.
- **SCD** - During the construction phase, employ and identify stone check dams in temporary diversions on steeper inclines to slow the flow.
- **TD / PD** – Temporary and permanent diversions are needed to control runoff on several lots. Diversion lengths should be truncated and utilize periodic TST's that can be converted to bioretention or rain garden facilities.

These measures should be identified in the legend and located on the field of the drawing.

4. Energy Dissipaters (LS)

Recommendation: Most of the soils that are to receive these discharges have a moderate to severe erosion hazard associated with them.

- Utilize the 25-year design criteria for all energy dissipaters.

5. MU – Mulch – Mulch exposed soils to limit detachment and transport at close of daily construction activity.

Stormwater Management

Multi-cell Basin Benefits – Increased capacity to sequester hazardous spills and contaminated runoff that allows added time for remediation. Raw water quality is enhanced by longer detention time, additional solids settling, lower cost, lower maintenance, greater volatilization of petroleum hydrocarbons and poly nuclear aromatic hydrocarbons, uptake of nutrients by plants, cooler final discharges, sequestering of heavy metals and an increase in aquatic habitat.

Optional Stormwater Treatment Facilities

- Swirl separator (Bayseparator) unit or similar best available technological unit is proposed for use on site. These units generally are quite costly.
- Optional engineered, dual baffled chamber with adequate storage capacity can be designed and produced at a quarter of the price of the aforementioned unit.

Note: These types of facilities only function properly if the regularly scheduled inspection and maintenance procedures are adhered to.

Alternate Design / Configuration

See Exhibit #4.

Limit disturbance of CrC Soil Type - Highly Erodible Land. (HEL)

1. **Proposed Detention Basin** - Relocate and redesign the proposed sedimentation basin to Lot #8. Configuration should be a Multi-celled basin with increased time of travel through the basin with micro-pools and wetland plantings to provide nutrient uptake and greater raw water renovation prior to discharge. Discharge should be through a Level Spreader designed to a minimum 25-year design criteria and the effluent reintroduced to the area between wetland flagging #48 thru 51.
2. **Lot #8** – Consider eliminating the dwelling on Lot #8 to accommodate multi-celled basin.
3. **Lot #9** – Shift dwelling and driveway closer to the proposed ROW for the sanitary sewer line to limit disturbance of steep slopes and reduce the risk of erosion and siltation of sensitive down slope environments. This would provide greater buffering of the pond from potential impacts.
4. **Lots # 2 & #7** – Consider eliminating these back lots to reduce unnecessary fragmentation of upland habitat that is crucial to the survival of amphibians in the adjoining wetlands, watercourses and Barbers Pond.

Note:

- Limits the alteration of the areas hydrologic affect on the wetlands.
- Reduces the fragmentation of the aquatic and upland habitat.

Environmental Reports - Flora / Fauna

There was no environmental report generated to assess and evaluate any natural resources on site let alone quantify or qualify the terrestrial or aquatic environments. It would be prudent to have this assessment done by an individual with expertise.

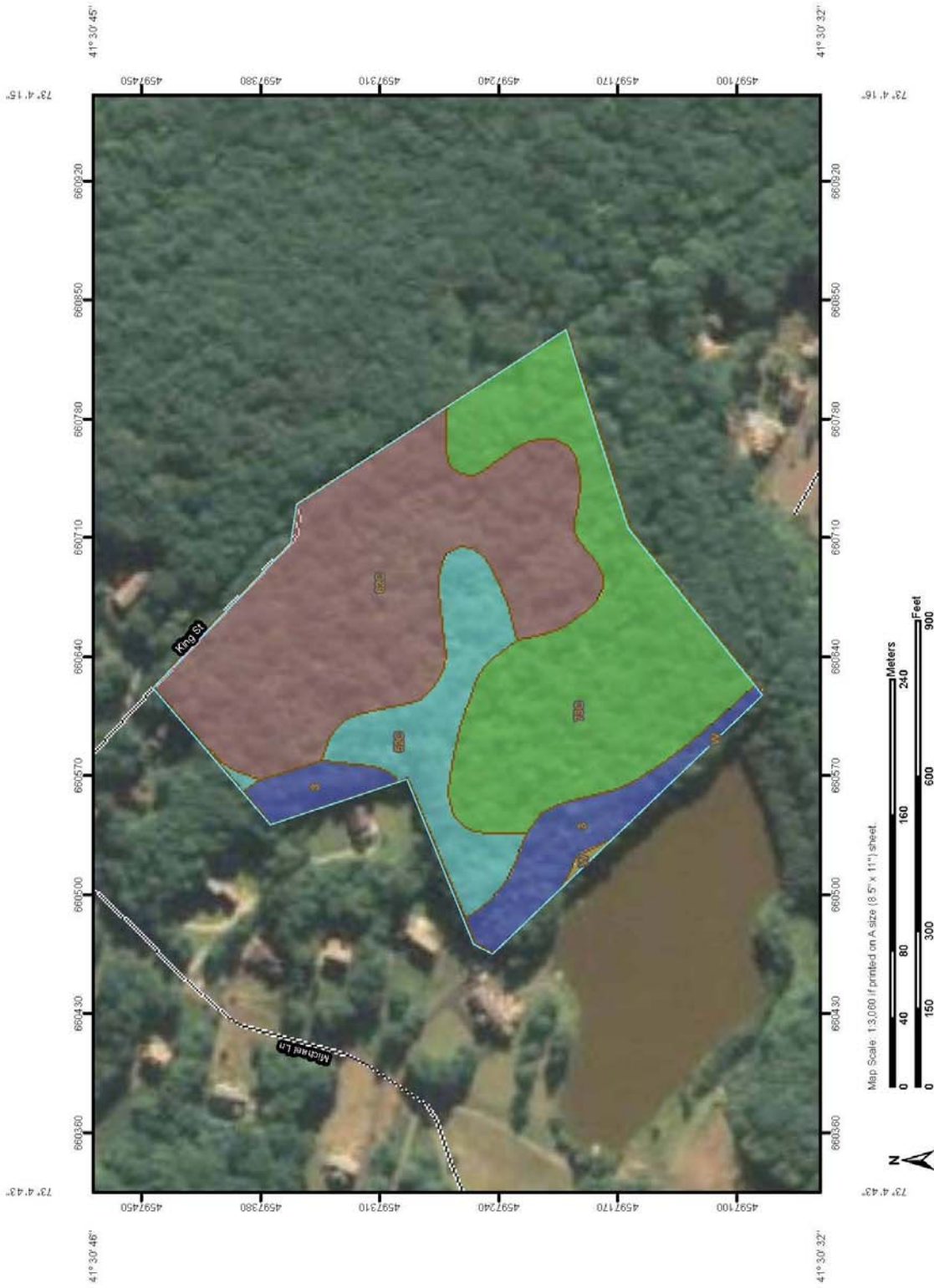
State Administered Programs

A general permit for the discharge of stormwater under the National Pollution Discharge Elimination System (NPDES) is required for Commercial and Construction Activities. This permit has three components to it. They are: 1) Registration with DEP, 2) A Stormwater Pollution Prevention Plan (SWPPP), and a Post Construction – 80% Solids Settling requirement. For further information on this program contact Christopher Stone of the CT DEP Permitting Enforcement and Remediation Division at (860) 424-3850.

Conclusion

The physical attributes of this parcel do not lend itself to this level of development. A redesign and reconfiguration would be prudent to avoid the steeper slopes and minimize the disturbance of soils with a severe erosion hazard.

Map Unit Name—State of Connecticut



MAP LEGEND

- Area of Interest (AOI)**
 - Area of Interest (AOI)
- Soils**
 - Soil Map Units
- Soil Ratings**
 - Canton and Charlton soils, 3 to 15 percent slopes, extremely stony
 - Charlton-Charlfield complex, 3 to 15 percent slopes, very rocky
 - Ridgebury, Leicester, and Whitman soils, extremely stony
 - Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony
 - Water
 - Not rated or not available
- Political Features**
 - Cities
- Water Features**
 - Oceans
 - Streams and Canals
- Transportation**
 - Rails

MAP INFORMATION

Map Scale: 1:3,060 if printed on A size (8.5" x 11") sheet.
 The soil surveys that comprise your AOI were mapped at 1:12,000. Please rely on the bar scale on each map sheet for accurate map measurements.

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

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

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

Date(s) aerial images were photographed: 8/14/2006

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

- Interstate Highways**
- US Routes**
- Major Roads**
- Local Roads**

Map Unit Name—State of Connecticut

Map Unit Name

Map Unit Name— Summary by Map Unit — State of Connecticut				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, extremely stony	Ridgebury, Leicester, and Whitman soils, extremely stony	1.6	9.8%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	2.0	12.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	6.7	42.1%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	5.6	35.3%
W	Water	Water	0.0	0.2%
Totals for Area of Interest			16.0	100.0%

Description

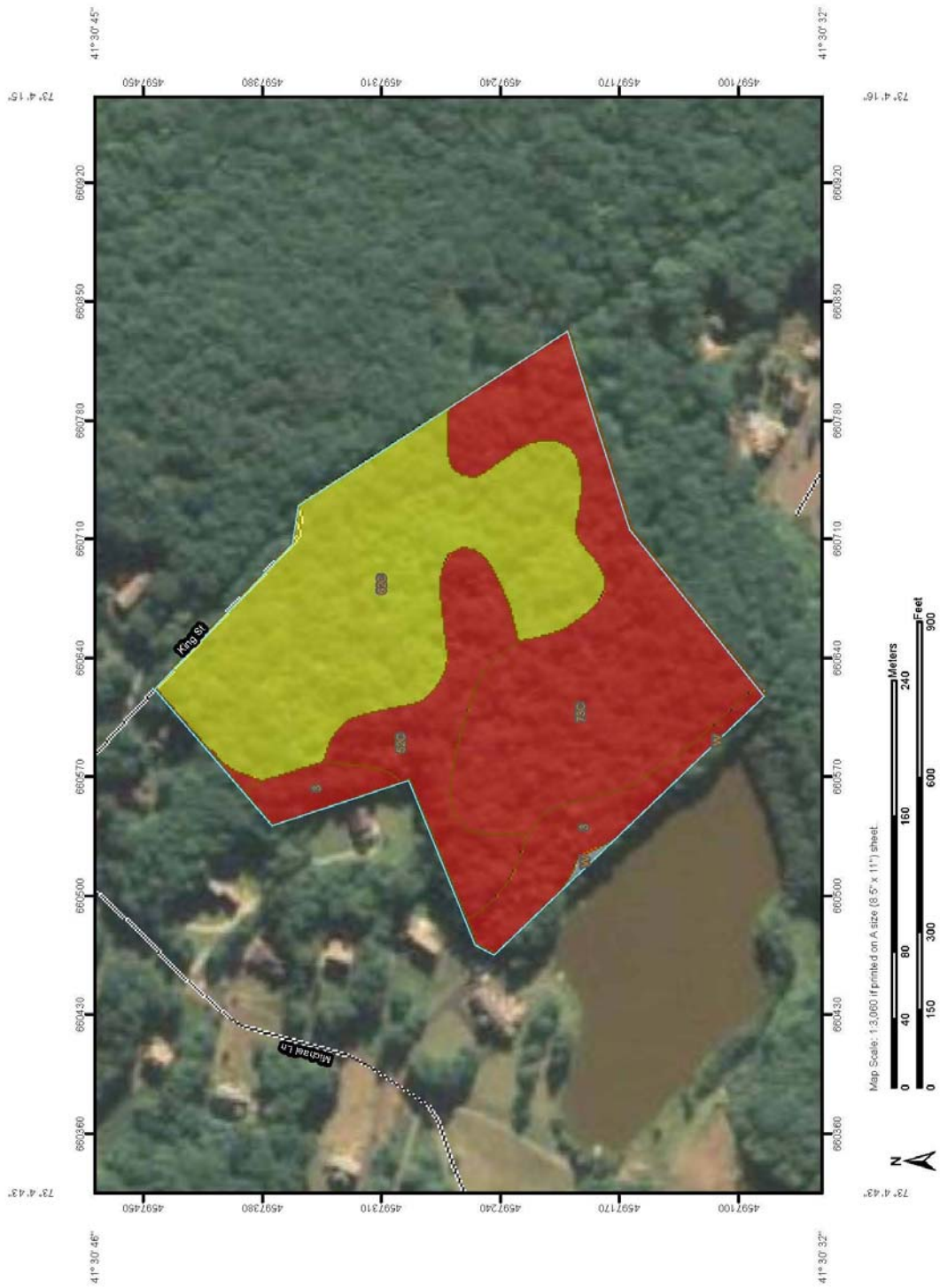
A soil map unit is a collection of soil areas or nonsoil areas (miscellaneous areas) delineated in a soil survey. Each map unit is given a name that uniquely identifies the unit in a particular soil survey area.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Dwellings With Basements—State of Connecticut

















Map Scale: 1:3,000 if printed on A size (8.5" x 11") sheet.



Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

-  Area of Interest (AOI)
-  Soil Map Units
- Soil Ratings**
 -  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
- Political Features**
 -  Cities
- Water Features**
 -  Oceans
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads

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 Coordinate System: UTM Zone 18N NAD83
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 Soil Survey Area: State of Connecticut
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 Date(s) aerial images were photographed: 8/14/2006
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Dwellings With Basements

Dwellings With Basements— Summary by Map Unit — State of Connecticut						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, extremely stony	Very limited	Ridgebury (40%)	Depth to saturated zone (1.00)	1.6	9.8%
			Leicester (35%)	Depth to saturated zone (1.00)		
			Whitman (15%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
			Sutton (2%)	Depth to saturated zone (1.00)		
Woodbridge (2%)	Depth to saturated zone (1.00)					
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	Very limited	Sutton (80%)	Depth to saturated zone (1.00)	2.0	12.7%
				Slope (0.04)		
			Paxton (3%)	Depth to saturated zone (1.00)		
				Slope (0.63)		
			Leicester (3%)	Depth to saturated zone (1.00)		
Woodbridge (2%)	Depth to saturated zone (1.00)					
	Slope (0.63)					
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	Somewhat limited	Canton (45%)	Slope (0.04)	6.7	42.1%
			Charlton (35%)	Slope (0.04)		
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	Very limited	Chatfield (30%)	Depth to hard bedrock (1.00)	5.6	35.3%
				Slope (0.04)		
			Sutton (5%)	Depth to saturated zone (1.00)		
			Leicester (5%)	Depth to saturated zone (1.00)		
			Hollis (5%)	Depth to hard bedrock (1.00)		
Slope (0.04)						
W	Water	Not rated	Water (100%)		0.0	0.2%
Totals for Area of Interest					16.0	100.0%

Dwellings With Basements—State of Connecticut

Dwellings With Basements— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	9.2	57.7%
Somewhat limited	6.7	42.1%
Null or Not Rated	0.0	0.2%
Totals for Area of Interest	16.0	100.0%

Description

Dwellings are single-family houses of three stories or less. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

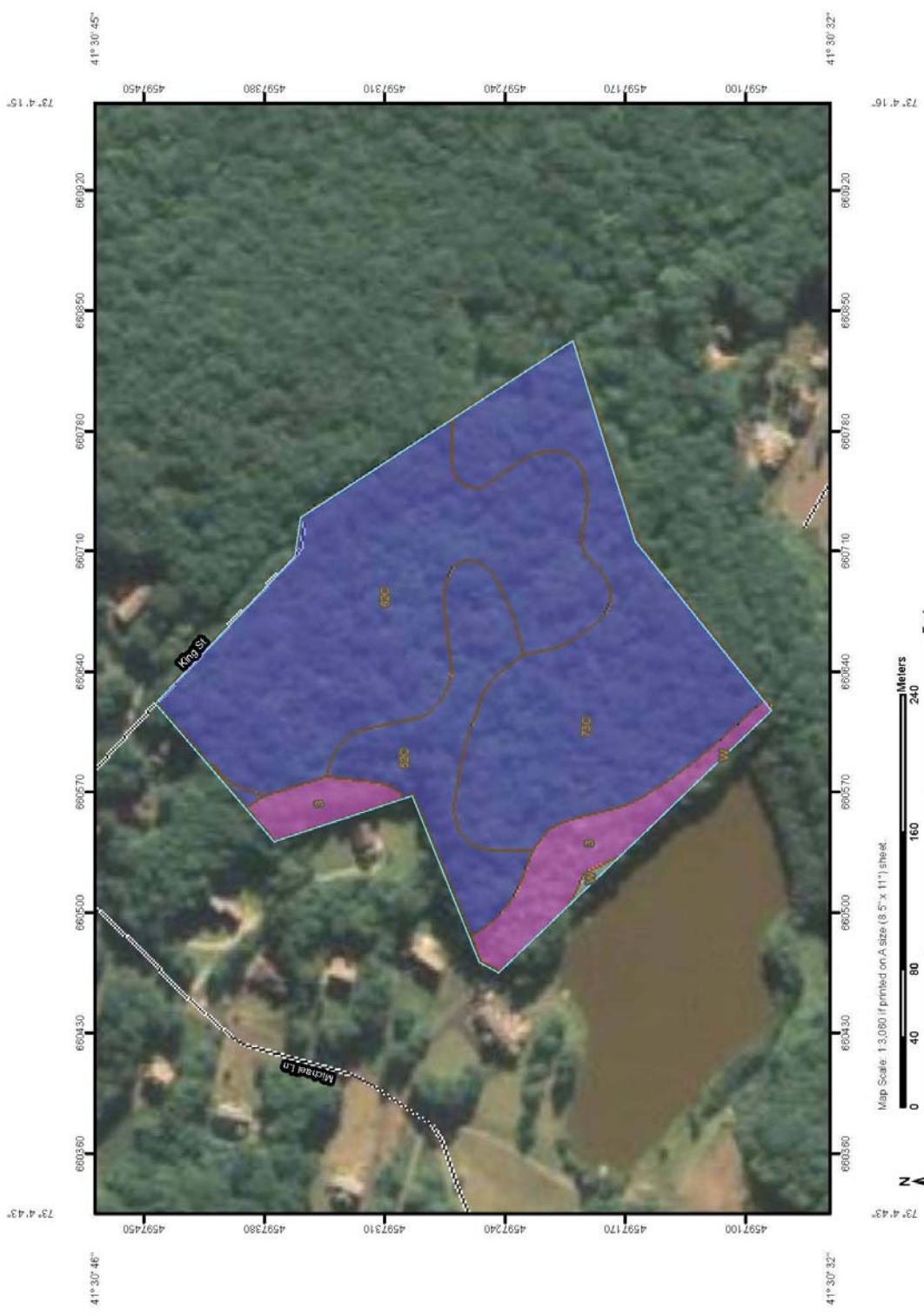
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Hydrologic Soil Group—State of Connecticut



MAP LEGEND

- Area of Interest (AOI)
 - Area of Interest (AOI)
- Soils
 - Soil Map Units
- Soil Ratings
 - A
 - A/D
 - B
 - B/D
 - C
 - C/D
 - D
 - Not rated or not available
- Political Features
 - Cities
- Water Features
 - Oceans
 - Streams and Canals
- Transportation
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads

MAP INFORMATION

Map Scale: 1:3,060 If printed on A size (9.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000. Please rely on the bar scale on each map sheet for accurate map measurements.

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

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

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 7, Dec 3, 2009
 Date(s) aerial images were photographed: 8/14/2006

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — State of Connecticut				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, extremely stony	D	1.6	9.8%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	B	2.0	12.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	B	6.7	42.1%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	B	5.6	35.3%
W	Water		0.0	0.2%
Totals for Area of Interest			16.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

EXHIBIT #4
ALTERNATE CONFIG. / E.P.'S

21

- NOTE 4) GSF ON FILLING OF SCOB REQUIRE WINGS AT 50' INTERVALS TO SLOW FLOW & TRAP SEDIMENT.
- NOTE 5) MUDLOCK EXPOSED SWLS TO LIMIT DETACHMENT AND TRANSPORT AT CLOSE OF DAILY CONSTRUCTION ACTIVITY.

- E.P.S LEGEND**
- TST - TEMPORARY SEDIMENT TRAP
 - TD/PPD - DIVERGENT SWALES
 - CE - CONSTRUCTION ENTRANCE
 - SCD - STORM CHECK DAMS
 - GSF/HB - GEOTEXTILE SW/ FENCE - ENHANCED w/ MAYBEE
 - TOPSOIL STOCKPILE
 - CONSIDERATE AS SHOWN
 - LS - LEVEL SPREADER
 - MF/MH - MUDLOCK
 - STORMWATER MGMT
 - STB - MULTI-CELL BASIN (Forcing onions, pools & hydroplankings)



SW CD, RSM 3/15/10
SCALE: N.T.S.

- Notes:
- 1) TST size 13' x 4' x 4' FOR EVERY ACRES OF EXPOSED SOIL
 - 2) TD/PPD - DIVERGENTS CAN BE CONVERTED TO W/S CENTER
 - 3) TST'S CAN BE CONVERTED TO BIORETENTION FACILITY TO REPLACE R5'S

STATE OF CONNECTICUT

Stormwater Management

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

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

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

The construction of the Paddock Ridge Subdivision, (“site”) will be regulated by the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (“the construction general permit”). In accordance with Sections 4(c) and 6(b)(6) of the construction general permit, respectively, a registration form must be filed and a Pollution Control Plan (“PCP”) must be prepared and implemented. The following review comments are based upon the requirements of the construction general permit.

Prior to submitting a registration form to the DEP, a review to verify compliance with State and National Historic Preservation statutes, regulation and policies and Endangered and Threatened Species Statutes must be conducted. Please contact the Historic Commission at 860-566-3005 for the historic preservation review. Endangered & Threatened species Information is available online at <http://www.dep.state.ct.us/cgnhs/nddb/nddbpdfs.asp>. If endangered/ threatened species are present in the project area, please contact Dawn McKay of the DEP at 860-424-3592. (Please see The Natural Diversity Data Base section) The project will not be permitted

under the construction general permit until compliance with these regulations/ statues is achieved.

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

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

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

The PCP must demonstrate that the post-construction stormwater treatment system has been designed with a goal of 80% removal of total suspended solids, pursuant to Section 6(b)(6)(C)(iii)(1) of the construction general permit. Such measures may include, but are not limited to, stormwater detention basins, stormwater retention basins, swirl concentrator technology structures (such as Vortech, Downstream Defender, Stormceptor, Stormtreat, or similar), vegetated swales, deep catch basin sumps (4’+) and stormwater infiltration devices. The PCP must also discuss the installation of velocity dissipation devices at all discharge locations as a post construction stormwater management measure. A detail of proposed measures must be provided. If site conditions allow, DEP recommends the installation of retention or detention basins because of maintenance, cost, and efficiency considerations. The elimination of point sources through the use of level spreaders or curb elimination is also recommended.

The construction general permit (Section 6(b)(6)(D)) requires inspections of all areas at

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

The following are comments specific to review of the erosion and sediment control plans for the site, and a site walk conducted on March 3, 2010:

- Special care should be used throughout the construction of the Paddock Ridge Subdivision. The site has some steep slopes and the soils are highly erodible. It is imperative that all applicable erosion and sediment controls be properly placed and maintained for the duration of the project and inspection schedules be strictly adhered to.
- During construction, a sediment trap and/ or a sediment basin with the ability to store 134 cubic yards of water storage per acre drained must be installed for drainage areas greater than 2 acres. For drainage areas where more than 5 acres is disturbed at any time, a sediment basin with an outlet engineered to remove sediment must be installed. The sediment forebays should be sized for 10% of the water quality volume with a 2:1 length to width ratio and designed in accordance with the guidelines specified in the 2004 CT Stormwater Quality Manual. In order to promote velocity reduction and solids settling, DEP recommends constructing the forebay berms with appropriate size of riprap with a core of stone (DOT #3).
- The sediment basin is in close proximity to an adjacent water body / wetlands. Should the basin fail due to inadequate design, lack of maintenance, etc., the absence of a buffer area would result in the immediate contamination of the wetland areas with sediment. A discharge of sediment to a wetland or watercourse without a permit would be a violation of Sections 22a-430 and 22a-42a(c)(1) of the Connecticut General Statutes and may require remedial action.

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

Key strategies for effective LID include: infiltrating, filtering, and storing as much stormwater as feasible, managing stormwater close to where the rain/snow falls, managing stormwater at multiple locations throughout the landscape, conserving and restoring natural vegetation and soils, preserving open space and minimizing land disturbance, designing the site to minimize impervious surfaces, and providing for maintenance and education. Water quality and quantity benefits are maximized when multiple techniques are grouped together. In areas of compacted and/or possibly contaminated soils, soil suitability should be further investigated prior to selecting

optimum treatment and/or remediation measures. Where soil conditions permit, we typically recommend the utilization of one, or a combination of, the following measures, some of which have been touched on previously:

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

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

Aquatic Habitats and Resources

Site Description, Aquatic Habitats

It is reported that there are 2.39 acres of wetlands on the 14.79-acre wooded site proposed for the Paddock Ridge residential subdivision however, there are no perennial watercourses or ponds. The wetlands do not provide habitat conducive for the support of fish.

Although there are no perennial watercourses or ponds on the site, the proposed 13-lot subdivision is adjacent to Barber's Pond (a.k.a. Tarzan Pond) located to the southwest and also to Pigeon Brook immediately downstream of Barber's Pond. Barber's Pond is an 8[±] acre waterbody that had been created by excavating a section of Pigeon Brook (CTDEP Drainage Basin#: 6916) and its adjoining riparian area. The water surface elevation of the pond had been raised by a low dam. Barber's Pond reportedly had a water depth of approximately 4 feet when first constructed. In the mid to late 1990's, the pond had been dredged to a depth of some 20 feet over much of its area. The dam is now breached and has lowered the original water surface elevation.

The small reach of Pigeon Brook, approximately 100 feet in length, is of low gradient and has been excavated immediately downstream of Barber's Pond. The excavation has created a small shallow pool.

Information of the fish species assemblage in Barber's Pond and Pigeon Brook are currently unavailable.

Impacts

Of the two adjacent surface waters, Barber's Pond will be most susceptible from development of the Paddock Ridge site. The most significant impact to the pond will result from stormwater discharge from the proposed residential subdivision both during construction and following the site's development. Without proper treatment, nutrients and sediments contained in the stormwater can accelerate eutrophication, which is the process of nutrient enrichment and basin filling. Accelerated eutrophication will be noted either by excessive algal blooms or the proliferation of rooted aquatic plants within shallow water areas around the pond perimeter. Excessive algal bloom during the summer months can lower the pond water dissolved oxygen to levels causing fish kills; a proliferation of aquatic plant growth around the pond perimeter can hinder water-based recreation.

Recommendations

It is imperative that the proposed stormwater management system be designed and be maintained to provide optimal removal of nutrients and sediments.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area (at the end of King Street and adjacent to the State Bridle Trail) have been reviewed. According to our information, there are records for State Special Concern *Terrapene Carolina Carolina* (eastern box turtle) from the vicinity of this project site.

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

If Eastern box turtle habitat is going to be impacted by this proposed project, the Wildlife Division recommends that a herpetologist familiar with the habitat requirements of these species conduct surveys between April and September to see if they are present. A report summarizing the results of such surveys should include habitat descriptions, reptile species list and a statement/resume giving the herpetologist's qualifications. The DEP doesn't maintain a list of qualified herpetologists. A DEP Wildlife Division permit may be required by the herpetologist to conduct survey work, you should ask if your herpetologist has one. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

Standard protocols for the protection of wetlands should be followed and maintained during the course of the project. Additionally, all silt fencing should be removed after soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

Please be advised that the Wildlife Division has not made a field inspection of the project 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 this work will take place will affect these species if they are present on the site when the work is scheduled. Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested. If the proposed project has not been initiated within 6 months of this review, contact the NDDB for an updated review. If you have any additional questions, please Julie.Victoria@ct.gov; please reference the NDDB #17460.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a

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

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

Recreation and Greenway Review

The project parcel has importance to the Larkin State Park Trail. There is potential for additional access and trail linkage to the Naugatuck State Forest. The equestrian community in Connecticut (The Connecticut Horse Council) is very enthusiastic about working with the Naugatuck Inland Wetlands Commission and the applicant on exploring trail linkages. The CT horse Council have been great advocates statewide and can contribute trail maintenance and patrol services. They would like to discuss the potential for additional trail head parking. The DEP Park Manager would be the contact for potential connections from the parcel to the Larkin State Park Trail most likely for the future homeowners.

Contact information to pursue a discussion about trail linkages and parking include:

Nate Hale
DEP Park Manager
(203) 938-2285
Nathan.hale@ct.gov

Alesia DiFrederico
stoneoaks@charter.net

Appendix

Connecticut Department of Environmental Protection

Eastern Box Turtle

Terrapene carolina carolina

State Species of Special Concern



Description

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

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

Range

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

Habitat and Diet

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

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

Life History

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

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

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

Conservation Concerns

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

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

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

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

How You Can Help

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



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

About the Team

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

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

Purpose of the Environmental Review Team

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

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

Requesting an Environmental Review

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

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