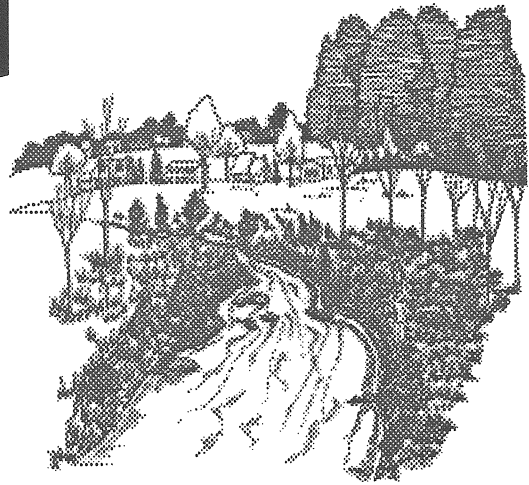


# **Litchfield Family Estates**



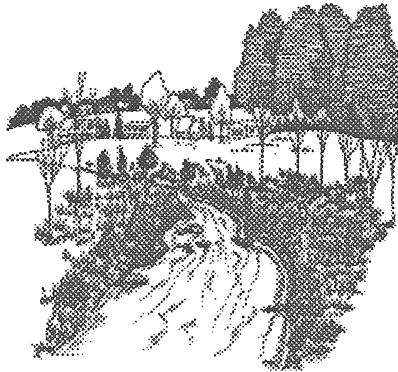
**Litchfield, Connecticut**

## **King's Mark Environmental Review Team Report**

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

# **Litchfield Family Estates**

## **Litchfield, 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  
Planning and Zoning Commission and  
the Inland Wetlands Commission  
Litchfield, Connecticut**

**February 2002**

**CT Environmental Review Teams  
1066 Saybrook Road, P.O. Box 70  
Haddam, CT 06442  
(860) 345-3977**

## **Acknowledgments**

This report is an outgrowth of a request from the Litchfield Planning and Zoning Commission and the Litchfield Inland Wetlands Commission to the Litchfield County Soil and Water Conservation District (SWCD). The SWCD referred this request to the King's Mark Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the King's Mark Environmental Review Team (ERT).

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

The field review took place on Thursday, December 20, 2001.

Nicholas Bellantoni	State Archaeologist Office of State Archaeology - UCONN (860) 486-5248
Sean Hayden	Resource Conservationist Litchfield County Soil and Water Conservation District (860) 626-7222
Alan Levere	Environmental Analyst III, Wetland Reviewer DEP - Environmental & Geographic Information Center (860) 424-3643
Richard Lynn	Director Litchfield Hills Council of Elected Officials (860) 491-9884
Dawn McKay	Biologist/Environmental Analyst DEP - Environmental and Geographic Information Center Natural Diversity Data Base (860) 424-3592

Don Mysling	Senior Fisheries Biologist DEP - Fisheries Division Habitat Conservation & Enhancement Program (860) 567-8998
Frank Schaub	Supervising Sanitary Engineer Department of Public Health Environmental Engineering Section (860)509-7296
Donna Seresin	Stormwater Permit Engineer DEP - Bureau of Water Management (860) 424-3267
Laura Saucier*	Resource Assistant/Wildlife Biologist DEP - Sessions Woods Wildlife Management Area (860) 675-8130
Judy Wilson	Wildlife Biologist DEP - Sessions Woods Wildlife Management Area (860) 675-8130

\*Report prepared in consultation with Judy Wilson.

I would also like to thank, Laura Cleminshaw, chair, planning and zoning commission, Bill Wilson, Vicki Clamar, planning and zoning commission members, Sue Kennedy, chair, inland wetlands commission, Barbara Brower, inland wetlands commission member, Ruth Mulcahey, land use administrator, Ken Hrica, engineer for the applicant, and David Bailin, applicant, 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 soils maps for the property. During the field review Team members were given additional information including plans and a project report. Some Team members made individual or additional visits to the project sites. 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 town and applicant. This report identifies the existing resource base and evaluates its significance to potential management, 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 proposed residential development.

If you require additional information please contact:

Elaine Sych, ERT Coordinator  
CT ERT Program  
P. O. Box 70  
Haddam, CT 06438  
(860) 345-3977

# Table Of Contents

	Page
Acknowledgments _____	ii-iv
Table of Contents _____	v
Introduction _____	1
Wetland Resources Review _____	5
Soil and Water Conservation District Review _____	12
Stormwater Review _____	19
On-Site Sewage Disposal and Water Supply Well Review _____	23
The Natural Diversity Data Base _____	25
Aquatic Resources _____	26
Wildlife Resources Review _____	30
Planning Considerations _____	31
Archaeological Review _____	34
Appendix A - Soils Information	
Appendix B - DEP Inland Fisheries Division Policy Statement on Riparian Corridor Protection and Position Statement on Buffer Zones	

# **Introduction**

## **Introduction**

The Litchfield Planning and Zoning Commission and the Inland Wetlands Commission have requested assistance from the King's Mark Environmental Review Team in conducting a review of the proposed Litchfield Family Estates Subdivision.

The project site is approximately 115 acres in size located on Goodhouse Road. Ten single family house lots are proposed with individual on-site sewage disposal systems and on-site water supply wells. The lots vary in size from a minimum of 2 acres to 25 acres with 17.36 acres of open space. Four lots will have direct access from Goodhouse Road. A private drive with one wetland crossing will be constructed for the six remaining lots. An  $\pm 8$  acre pond with a dam is in the center of the parcel, and a large north-south trending wetland system is also on site.

## **Objectives of the ERT Study**

The commissions are requesting the ERT to have additional technical assistance in reviewing the proposed project. The report will aid the commissions in their analysis of possible environmental and land use impacts to the town. Of specific concern are: impacts to on-site and off-site wetlands and watercourses, aquatic impacts, stormwater management, sewage disposal, site design, and open space designation and use. The ERT report will provide natural resource information, a discussion of potential impacts, and guidelines and recommendations for the protection of natural, cultural and community resources.

## **The ERT Process**

Through the efforts of the planning and zoning commission and the inland wetlands commission this environmental review and report was prepared for the Town of Litchfield.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the commissions. Team members were able to review maps, plans and supporting documentation provided by the applicant and 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 on Thursday, December 20, 2001. Some Team members made individual and/or additional site 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.

Figure 1.

Location and Topographic Map

Scale 1" = 2000'

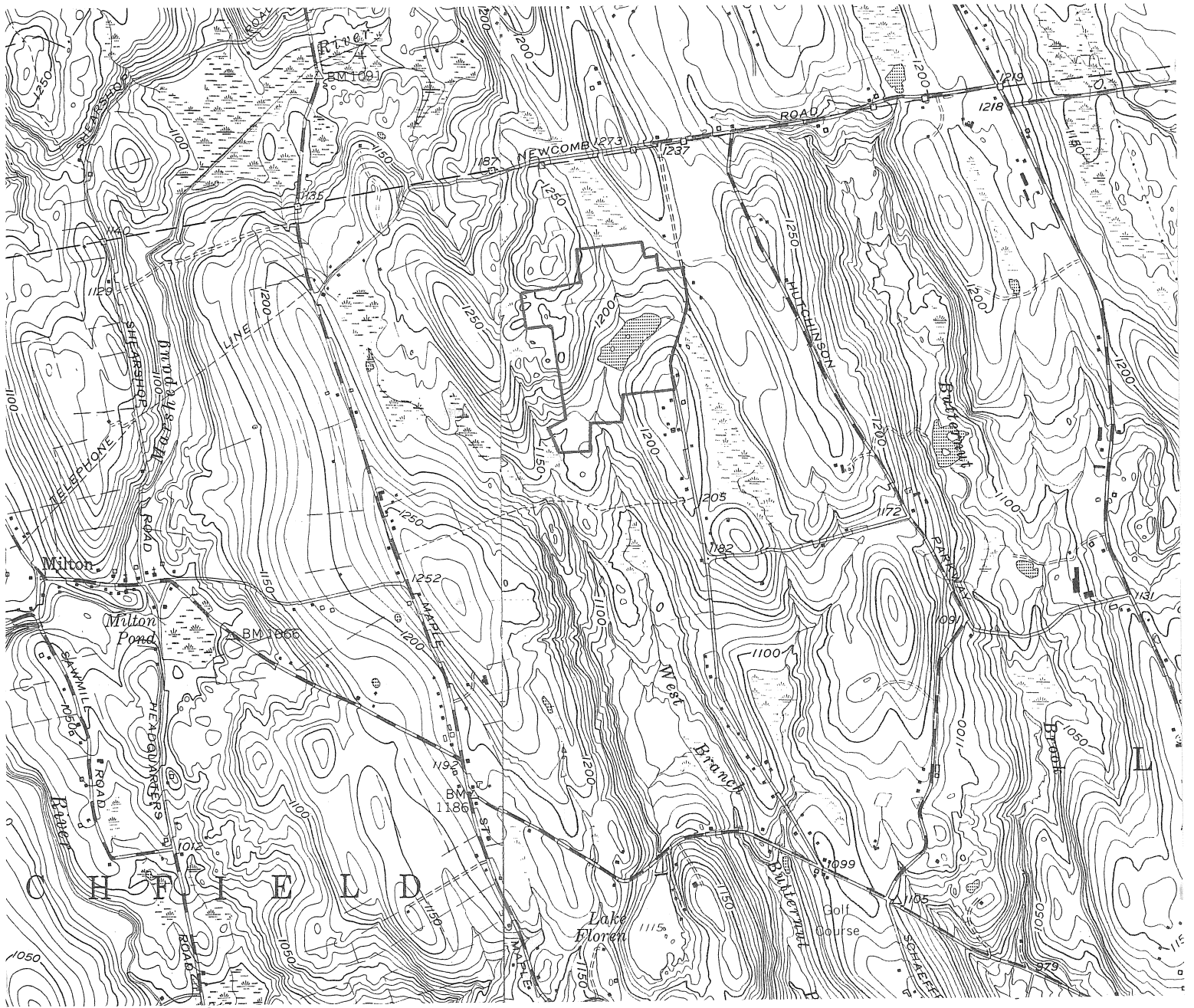


Figure 2.

Soils Map



# Wetland Resources Review

## **Site Overview**

The site is located in the north central part of town and reportedly encompasses  $\pm 115.7$  acres.<sup>1</sup> The site is predominantly wooded with the exception being the area of the pond, which is more or less in the center of the parcel. The pond is about  $\pm 7.8$  acres in size. The highest point on the property is towards the northeast where it reaches between 1,250 and 1,260 feet above sea level. Where the stream that drains the pond leaves the property the elevation is about 1,149 feet, but the lowest point is further to the west where smaller (intermittent?) streams leave the parcel at about 1,140 feet. The stream that flows out of the pond and off the parcel is a tributary to Butternut Brook which flows into the Shepaug River and ultimately into the Housatonic River. The pond itself is estimated to be 6 to 12 feet deep with the deepest water being by the dam. This depth estimate would fit well with what the pre-pond topographic map shows (see Figure 3). Here the pond site exists within the change of one contour interval, or ten feet. If there was excavation or earth moving from the marsh to form the dam, the near-dam depth could be deeper as a result.

The outlet for the pond is a combination of two pipes passing through the dam. On the north end of the dam is an ~18 inch concrete pipe that was passing water less than an inch in depth and three or four inches in width on the date of the field review. The other outlet is roughly in the middle of the dam and is substantially larger. It is an aluminum pipe, approximately 24 - 30 inches in diameter and drops audibly splashing water a few feet from the pipe lip to the ground below. Below the dam the waters from the two outlets converge in a

---

<sup>1</sup> Some discrepancy exists between the size of the property boundary that was distributed to the Team versus the number cited here. The boundary as distributed to the Team was planimeted three times using two different methods and measured an average of 87.5 acres. This is about 76% of the number cited here, this difference should be rectified for the various commissions for clarity.

scrub shrub and laterally forested wetland and flow off the property as a tributary to Butternut Brook.

The watershed for the stream that enters the pond from the north measures about  $\pm 50$  acres in size. Of this acreage about 20 acres are mapped as wetland. This translates to a stream leading into the pond that is draining a watershed consisting of wetland, forest, and farmland - a scenario that exhibits the classic wetland sponge analogy: the wetland soaks up water and releases it slowly back onto the landscape. Thus, the stream was flowing on the ERT field visit on December 20, 2001, when the most recent rainfall was a little over a half an inch 48 hours previous and in a time period which was nine to ten inches precipitation deficient for the year.

The wetland areas most easily observed from aerial photos and topographic maps are the pond and the stream flowing in and out. Less subtle wetlands on the property, those not impacted by proposed development, are in the extreme southwest of the parcel.

### **National Wetland Inventory**

The U.S. Fish and Wildlife Service has mapped and classified the wetlands and watercourses using a system of codes for all the topographic maps in the state. This parcel occurs on the West Torrington quadrangle National Wetland Inventory map. All of the wetlands on the site are mapped as palustrine wetlands. Palustrine is defined as: *of or pertaining to a swamp; marshy.*

The classifications for the stream flowing into and out of the pond are the same: PFO1E which is Palustrine (P), Forested (FO), Broad leafed deciduous (1), Seasonally saturated (E). The pond itself is classified as: POWHh - Palustrine, Open water (OW), Permanent (H), diked (h).



## **Water Quality**

The surface water quality (which includes the wetlands and watercourses) of the area have been mapped by the DEP as follows:

- The watercourses that flow into the pond, the pond, and the outflow from the pond as well as any other surface waters on the property are classified as AA. Although not all of these locations have been field-tested, the assumption of quality is made based on a variety of indicators that point to excellent surface water quality in the drainage.
- The same is true for the ground water quality. The entire parcel is classified as GAA which is the highest classification given in the state. As with the surface water, not all of this was field checked for the creation of the map but indications point to, and the result is mapped as, excellent ground water quality.

The water quality classifications as described in *Summary of the Water Quality Standards and Classifications (1997)* are as follows:

### **Inland surface water classifications**

*Class AA* Designated uses: existing or proposed drinking water supply, fish and wildlife habitat, recreational use (may be restricted,) agricultural and industrial supply. Discharge restricted to: discharges from public or private drinking water treatment systems, dredging and dewatering, emergency and clean water discharges.

### **Groundwater Classifications**

*Class GAA* Designated uses: existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically connected surface

water bodies. Discharges limited to: treated domestic sewage, certain agricultural wastes, certain water treatment wastewaters.

### **Wetland Soils**

The soils have been mapped on the site plans and flagged in the field by Edward M. Pawlak of Connecticut Ecosystems. This made the locating of the wetland crossing and the various wetland boundaries an easy task in the field. Mr. Pawlak describes the wetland soils in the project report submitted to Litchfield Estates, LLC as being dominated by Peat and Mucks to the north of the pond and the Leicester, Whitman, Ridgebury complex east and south of the pond. The upland soils are dominated by Paxton soils with some Woodbridge soil downslope from these and above the wetland soils.

### **Concerns and Recommendations**

#### **The Pond**

There was much talk about the history of the pond and the date of its creation. A review the 1951 edition of the USGS West Torrington topographic map which was surveyed in 1944 and field checked in 1948 shows the pond was not represented at that time. A review of aerial photographs taken 3/31/1965 in the collection at DEP shows the pond was there then and subsequently depicted on the photorevised in 1969 USGS topographic map.

Figure 3.



No pond appears on this topographic map which used 1944 aerials; and was field checked in 1948

The pond first appears on the 1969 photorevised map

Recent topo with proposed subdivision added

### Stream Crossing

The crossing of the road over the stream that comes onto the property from the north is the largest proposed impact by this development. The proposal shows the stream passing through twin 24 inch pipes. Discussion in the field however altered that design to spanning the watercourse with the goal of leaving the streambed and riparian wetland intact. This can be best accomplished with a clear span bridge or to a lesser degree an open bottom box culvert(s). Either of these options would feature:

- less potential for erosion and sedimentation problems during construction,
- use less total fill than with the twin pipe design, and
- offer post-construction preservation of the streambed and wetland.

### Potential Future Impacts from Lot Development

Work that will be conducted on the site in the future could also be an issue, specifically since much of the individual land alteration which will occur

on the buildable lots will be in the hands of the future homeowner. The time to determine any needed areas of resource protection is now. Two key issues were raised: 1) the clearing of the landscape of vegetation for views, and 2) the clearing of lots for, and the long term treatment of, lawns abutting the lake.

1) Loss of vegetation due to cutting (i.e.: for views) can destabilize the hillside soils with the resulting sediment runoff directed downslope, typically to wetlands and watercourses. Any vegetation removal/cutting to improve line of sight should be approved by the homeowner's association since the potential sedimentation problems for the pond will become an association problem later.

2) The other potential water quality problem would be the clearing of a lot to have lawn right to the water's edge. The DEP recommends, and the town of Litchfield has established, wetland and open water buffers. Since buffers are recognized as reducing the amounts of sediments, nutrients, pesticides and fertilizers (to name a few) that impact surface water, and since the pond seems to have found an ecological balance of pH, vegetation, finfish and wildlife habitat, the association should consider, as a matter of policy, limits to the width of lawn which will contact the water's edge. Consideration should be given on how best to document Best Management Practices or restrictions for pesticide and fertilizer applications. This will work to preserve the ponds' existing AA water quality. The wider the buffer the more effective it is. The seven lots that abut the pond have an average waterfront of about 340 feet. Perhaps a percentage of the lot width or a maximum width for any lot will fit the need.

More information on buffers can be found at the Connecticut River Joint Commissions (CRJC) web site located at [www.crjc.org](http://www.crjc.org). The goal is not to reduce the homeowner's access to the water but to maintain the water quality of the pond.

The CRJC in their *Part of the Living with the River Series* on riparian buffers suggests, "The first goal is to avoid planting lawn to the water's edge . . . this is the worst and most common mistake . . . and deliver(s) lawn chemicals directly to the stream".

### Dam Ownership

As it was presented on the site plan, the dam is divided into three separate parcels of ownership. Lot number 8 shows ownership of the northwest portion including the overflow pipe, the open space has the bulk of the dam within its boundaries including the main spillway pipe, and Lot 2 includes the southeast portion of the dam. For ease of maintenance decision making it is recommended that the dam be completely included in a single, association-governed parcel. That way the entire association, not one or two land owners, will be able govern any dam related decisions.

### Adjoining Open Space

The 17 plus acres of open space that is being set aside is dominated by stream courses and riparian wetlands. This wetland complex is a part of a tributary system of the West Branch of Butternut Brook. When the adjacent area is proposed for development in the future Litchfield might well be served if the abutting land is also set aside as open space to protect the functions of this headwaters wetland and the functions it now exhibits.

# **Soil and Water Conservation**

## **District Review**

This section contains an Erosion and Sediment Control plan review. This report will assess how well the developer addressed erosion and sediment control issues associated with the development of site located and also reviews environmental issues directly affected by stormwater runoff.

These recommendations are based on the following:

- A site walk with the site engineer (Ken Hrica of CCA Engineering and Surveyors, LLC) that occurred on January 30, 2002.
- All the materials included in the site drawings which include; Subdivision Plans, Site Development Plans, Plan and Profile, Notes and Details and the Sediment and Erosion Control Plan. The meeting also included a site inspection. Both the meeting and the site inspection took place on October 17, 2000.
- The Litchfield Family Estates Project Report.

### **Sediment and Erosion Control Plan and Construction Sequence Recommendations**

#### **Sediment and Erosion Control Worksheet**

The Sediment and Erosion Control Plan and Construction Sequence narrative does an excellent job of addressing most measures that will minimize soil movement. The Team resource conservationist has attached a checklist titled "Erosion and Sediment Control and Stormwater Management Plan Worksheet" that is used to assure that a Sediment and Erosion Control Plan is complete. He has placed an "x" on all the items addressed in the plan of development and an "na" adjacent to the items that are not applicable. He has left a blank where items

have not been addressed. Please read and consider including the blank items into the plan of development.

#### Preservation of Woodlands for Water Quality Protection

The open water feature within the development is the centerpiece of the property. Ponds in Connecticut are very vulnerable to construction activities, which are the largest contributor of Non-point Source (NPS) Pollution (NRDC, 1999).

*NPS pollution is diffuse discharges that emanate from areas in the watershed but do not necessarily enter watercourses at any one point. NPS discharges are intermittent and are usually associated with precipitation and runoff events.*

Since erosion rates are much higher for construction sites relative to other land use, the total yield of constituents that cause water quality reduction are higher (NRDC, 1999). Studies indicate that poorly managed construction sites can yield as much as 1,000 tons of sediments per acre, as compared to 1 ton per acre or less for forest land (NRDC, 1999). Therefore, the following should be considered when developing Litchfield Family Estates to protect the open water resources.

Plans for the proposed development include the preservation of woodlands and wooded wetland for open space. The development plan should also delineate clearly defined construction boundaries, which should be indicated on the site plan drawings. Before construction begins the limits should be marked in the field. This will help protect the environmental value and integrity of existing vegetation throughout the construction phase. The wooded areas will serve well as a buffer to stabilize soil disturbed by adjacent construction activities. This in-turn will preserve the water quality of the pond.

### Soil Capabilities and Limitations

There were several soil types identified by Connecticut Ecosystems, LLC's Soil Report. All the upland soils have a high erosion hazard (USDA, 1970) and the two soil types (Pb and Wx) that encompass most of the construction area are classified as Highly Erodible Soil (USDA, 1986). The other soil types identified do not have the Highly Erodible Soil designation.

However, once the topsoil and the upper soil horizons are removed the subsurface horizons are exposed. Once exposed these lower soil horizons will then have all the properties of a Highly Erodible Soil. Observations during the site visit also indicated that there may be areas where soils are thin. Therefore, extreme care is needed when stabilizing exposed soils (see the section on Sediment and Soil Erosion Control Plan above). For a more detailed review of on site soil properties and how they are effected by specific management practices, the following capabilities and limitations information for each soil type found on site is contained in Appendix A.

- Soil Map Legend - This section interprets the soil map symbol
- Soil Features - This section details depth, potential frost action and corrosion hazard.
- Water Features - This section details the potential for flooding, ponding and a high water table.
- Non-technical Soils Description Report
- Building and Site Development - This section describes the soils capabilities and limitations as they relate to construction.
- Construction Materials - This section describes the soil capabilities and limitations as related to use as building and construction material.
- Hydric Soil List, Soil Map Units With Hydric Components
- Sanitary Facilities - This section describes the soil capabilities and limitations With respect to septic disposal.



- Wildlife Habitat Value
- Prime Farmland Soils

### **References**

Natural Resource Defense Council, 1999. Storm Water Strategies. Community Response To Runoff Pollution, Natural Resource Defense Council Inc.

United States Department of Agriculture, 1986. Soil Survey of Litchfield County Addendum, Soil Conservation Service. USDA, Washington DC.

United States Department of Agriculture, 1970. Soil Survey of Litchfield County, Soil Conservation Service. USDA, Washington DC.

Erosion & Sediment Control and  
Stormwater Management Plan Worksheet

16

Project Name Litchfield Family Estates  
Town Litchfield Location Goodhouse Road  
Town Staff Contact Ruth Mulcahy Phone Number 860-567-7565  
Date Received for Review Jan 30 2002 Requested Completion Date Jun 31 2002  
Submitted for Review by \_\_\_\_\_  
Materials Received for Review Site Walk Note, Plan of Development, Project Report ERT

Total Area of Project (acres) 115.7 Total number acres of disturbed land \_\_\_\_\_  
Number of Lots 10 Project Engineer Ken Hricu  
Site Visit Date Jun 20 2002 Reviewed By Sean Hayden  
Review Completion Date Jun 31 2002

**Narrative Section including information on the following:**

- Purpose and description of the project, including ultimate land use.
- Estimates of total acres in the project site and total acres expected to be disturbed by the project.
- Identification of site-specific erosion or sediment control concerns and issues.
- Identification of off-site erosion or sediment control and issues.
- Phases of development. If more than one phase is planned, indicate sequence of implementation.
- Anticipated start and completion dates for each phase of the project.\*
- Provide or identify where in the E&S plan the following information is found:
  - Design criteria, construction details, and maintenance program for proposed erosion and sediment control measures;
  - Sequence of major operations in each phase, such as installation of erosion control measures, clearing, grubbing, grading, excavation, drainage and utility installation, temporary stabilization, road base, paving for roadways and parking areas, building construction, permanent stabilization, removal of temporary erosion control measures;
  - Time (days) necessary to complete major operations included in the sequence.
- Identification of other required local, state, and federal permits.
- Conservation practices to be used.
- List of all other documents to be considered part of the E&S plan (e.g. reports of hydraulic and hydrologic computations, boring logs, test pit logs, soils reports, etc...)

**Support Documentation for Engineered Measures:**

- Hydraulic Calculations (both on site and relevant off site)
  - Size and locations of existing and proposed channels or waterways with design calculations and construction details.
  - Existing pre-development peak flows with calculations.
  - Anticipated post-development peak flows with calculations.
  - Changes in peak flows.
  - Potential off-site effects of increased peak flows or volumes.

\* Dates are often subject to change depending on markets, financing, permit approvals and weather conditions. A change in a start date can mean a restriction or prohibition for the use of proposed measures, and, therefore, require revisions to the E&S plan.

**Erosion & Sediment Control and  
Stormwater Management Plan Worksheet**

17

**Support Documentation (cont'd):**

- Design calculations and construction details for measures intended to control erosion .
- Design calculations and construction details for measures intended to control groundwater (i.e. seeps, high water table, etc...).
- Boring logs, test pit logs, soils reports, etc...
- Impervious surface coverage percentage.
  - Roof.
  - Parking.
  - Other.

**Site Illustration(s) Checklist:**

*Features Required on All Maps or Illustrations*

- North arrow.
- Scale (including graphical scale).
- Title block including: name of the project, author of the map or illustration, owner of record for the project, date of illustration creation and any revision dates.
- Property lines.
- Legend.
- Signature and seal of professional engineer.
- Name and signature of project soil scientist.

*Site Locus map*

- Scale (1:24,000 recommended).
- Project location (showing property boundaries and area within 1,000 feet of property boundaries).
- Roads, streets, buildings.
- Major drainage ways (at least named watercourses).
- ~~NA~~ Public water supply watershed areas, well heads and aquifer boundaries.

*Topography, Natural Features, and Regulatory Boundaries*

- Existing contours (two [2] foot intervals).
- Proposed grades and elevations.
- Limits of cuts and/or fills.
- Upland soil boundaries.
- Seeps, springs.
- Inland wetlands boundaries.
- ~~NA~~ FEMA identified floodplains, floodways.
- State established stream channel encroachment lines (DEP permit).
- Streams, lakes, ponds, drainage ways, dams.
- Existing vegetation.
- ~~NA~~ Tidal wetland boundaries and coastal resource limits (e.g. mean high water, shellfish beds, submerged aquatic vegetation, CAM boundary).

*Road and Utility Systems*

- Proposed and existing roads and buildings with their locations and elevations.
- Access roads (temporary and permanent).
- Location of existing and/or proposed septic systems.
- ~~NA~~ Location and size of existing and/or proposed sanitary sewers.
- Location of other existing and/or proposed utilities, i.e. telephone, electric, gas, water, etc...

4

## Erosion & Sediment Control and Stormwater Management Plan Worksheet

### Site Illustration(s) Checklist (cont'd):

#### *Drainage Patterns*

- Existing and proposed drainage patterns.
- Size of drainage areas (acres, square feet).
- Size and location of culverts and storm sewers (existing and proposed).
- Size and location of existing and proposed channels or waterways, including design calculations and construction details to control channel erosion.
- \_\_\_ Major adjacent/surrounding land uses:
  - \_\_\_ Current.
  - \_\_\_ Zoned/proposed.

#### *Clearing, Grading, Vegetative Stabilization*

- \_\_\_ Areas to be cleared, and sequence.
- \_\_\_ Disposal of cleared material (off-site and/or on-site).
- \_\_\_ Areas to be graded or excavated, and sequence of grading or excavation.
- \_\_\_ Slopes of cuts or fills.
- \_\_\_ Areas and acreage to be armored or structurally stabilized.
- \_\_\_ Areas and acreage to be vegetatively stabilized (temporary and/or permanent).
- Proposed vegetation including details of plants, seed, mulch, fertilizer, lime, planting dates, etc...

### Erosion and Sediment Control Illustrations:

#### *Project Development*

- Location of E&S measures on site plan with appropriate symbol.
- Construction illustrations and specifications for measures (e.g. construction entrances).
- Maintenance requirements of measures during construction.
- Person(s) responsible for maintenance during construction.
- Maintenance requirements of permanent measures after project completion.
- Organization or person(s) responsible for maintenance of permanent measures with the authority to maintain, as designed, or upgrade, as needed, measures to control erosion and sedimentation.
- \_\_\_ Handling of emergency situations (e.g. severe flooding, rains or other environmental problems).
- Design criteria, construction details, and maintenance program for proposed E&S measures; sequence of major operations within each phase; time (days) required for major operations identified in the sequence (if not provided in the Narrative section of checklist).

#### *Individual Lot Development*

- Sediment and erosion control measures for individual lots.

#### *Resource Extraction associated with development or extraction operations, including quarrying:*

- NA Enhanced sediment and erosion control measures with applicable federal/state/local permits.

### Additional Comments:

## **Stormwater Review**

### **Stormwater Permitting**

Since the site construction involves the disturbance of over five acres, Connecticut's (General Permit for the Discharge of Stormwater and Dewatering Wastewaters ("the Permit")) will cover the project. The Permit requires that the site register with the Department of Environmental Protection (CTDEP) at least 30 days before the start of construction. The registrant must also prepare, submit and keep on site during the construction project a Stormwater Pollution Control Plan ("the Plan"). If the Department finds that the Plan is inadequate, Connecticut General Statutes Section 22a-430b and Permit Section 7(c) allow the Commissioner to require an individual permit, a process that could delay approval of the project for several months. In order to prevent this and to ensure adequate review time, the Department has requested early submittal of the Plan.

Please note that while this review is based primarily on the Permit, many of the erosion and sedimentation issues are included in the Connecticut Guidelines for Soil Erosion and Sediment Control ("the guidelines"), and are issues that must be dealt with on a local level before being included in the Plan. It should also be noted that the permit requires compliance with the guidelines. The developer must register for the Permit, and the contractor and any subcontractors involved in grading must sign the contractor certification statement in the Permit. Any registration submitted by anyone other than the developer will be rejected.

The Plan must include a site map as described in Section 6(b)(6)(A) of the Permit and a copy of the erosion and sedimentation (E & S) control plan for the site. The E & S plan that has been approved by the Town in conjunction with the CTDEP Inland Water Resources Division (IWRD) and the local Soil and Water Conservation District may be included in the Plan. This plan and site map must

include specifics on controls that will be used during each phase of construction. Specific site maps and controls must be described in the Plan, as well as construction details for each control used. The Permit requires that the plan shall ensure and demonstrate compliance with the guidelines.

Due to the amount of soil disturbance, one of the best ways to minimize erosion potential is to phase construction in order to minimize unstable areas. The Plan must be flexible to account for adjustment of controls as necessary in order to meet field conditions. At a minimum, the Plan must include interior controls appropriate to different phases of construction. The plan should identify areas where stock piling of soil will occur and detail the type of erosion controls that will be used.

This project has a pond and numerous wetland areas to be protected, which will make ongoing inspections and adjustments of controls a critical aspect of this project. The 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 Plan must also give the inspector the authority to require additional control measures if the inspection finds them necessary, and should note the qualifications of personnel doing the inspections. In addition, the Plan must include monthly inspections of stabilized areas for at least three months *following* stabilization.

In particular, since phasing will be difficult and a large amount of disturbance will occur at once, there must be someone available to design and adjust E & S controls for changing site conditions, who has the authority and resources to ensure that such necessary changes are implemented. Section 6(b)(6)(C)(ii) of the Permit requires the Plan to address dewatering wastewaters, which this site may generate. Specific details for construction control during installation of all wetland crossings must be provided.

Particular attention must be paid to the construction in the area of the site, which has some poorly drained soils.

### **Post-construction Stormwater Treatment**

The Plan must include a design for post-construction stormwater treatment with a goal of 80% removal of total suspended solids from the stormwater discharge. Such measures can include but are not limited to: stormwater detention; stormwater retention; vegetative buffers; infiltration of run-off on-site; and swirl concentrator technologies. If you choose to employ a swirl concentrator, then the Plan must include sizing calculations for the swirl concentrators. The installation of a swirl concentrator would require a long-term maintenance commitment from the town or a homeowners association.

### **Erosion and Sediment Control Notes**

The Permit stabilization requirements include the following: where construction activities have permanently ceased or have temporarily been suspended for more than seven days or where final grades are reached in any portion of the site, stabilization practices shall be implemented within three days. Section 6(C)(i) of the Permit requires when construction activities have permanently ceased or been temporarily suspended for more than seven days or when final grades are reached at any portion of the site, stabilization must occur within three days.

*Minimization of disturbed areas and prompt stabilization will be key aspects to avoidance of pollution from this project.*

**Other Issues**

Please include in the Plan a detail for the wetland crossing that will be installed at the site. The design should provide for a minimal impact on the wetlands in the area.

This report touches on some of the major issues concerning the project and does not constitute a complete review of the project for permitting purposes.



## **On-Site Sewage Disposal** **and Water Supply Well Review**

The plans reviewed were prepared by Kenneth S. Hrica, PE, LS, with the engineering firm CCA, LLC dated October 3, 2001. The lots range in 2.0 to 25.3 acres in size and 7 of the 10 have frontage along an 8-acre pond within the subdivision.

All lots will be served by an on-site sewage disposal systems located at least 150 feet from watercourses and private wells. Extensive deep test pits and percolation test holes have been dug to determine suitable locations for sewage disposal systems. Staff from the Torrington Area Health District have witnessed the testing and confirm the accuracy of data submitted. Sewage disposal systems are primarily laid out in areas defined as Paxton and Woodbridge soils. These soils are somewhat restricted with respect to sewage disposal in that compact glacial soils are found generally 20 to 30 inches below existing grades. The shallow upper soil layers are suitable for leaching system construction but require wide application of leaching fields and placement of select fill material to assure bottoms of leaching systems are kept at least 18 inches above the compact soil layers. Many of the lots are provided with curtain drains to intercept seasonably perched water flowing on top of the glacial soils. In some cases, the proposed dwellings with associated footing drains also provide subsurface ground water control. Each of the ten lots is shown with a proposed four-bedroom residence and it is likely that many of the dwellings could be expanded with additional soil testing and revision of plans for sewage system design. The one exception is Lot 3, which has limited capacity for leaching system expansion due to the restrictions with the existing pond and wetland setbacks.

In general, sewage disposal system designs and well locations appear satisfactory and meet minimum requirements of the Public Health Code. A detailed review

of plans will be performed by the Torrington Area Health District staff upon application for individual building permits if the subdivision is subsequently approved. Of all the designated leaching areas, the proposed site serving Lot 9 is of concern due to the driveway access for Lot 8 located immediately down gradient from the primary and reserve leaching areas. Deep test pits conducted upgradient show ledge rock at relatively shallow depths below grades, 36 to 54 inches deep. The concern is that driveway construction downgrade from the leaching area could interfere with continued subsurface treatment of effluent and ground water flow. To avoid this, the driveway could be specifically constructed with select fill material used for leaching system improvement to facilitate subsurface flow to the other side. Consideration could also be given to shifting the driveway southeasterly to increase the separation distance.

Based upon the overall site density, it is unlikely that properly constructed septic systems will adversely effect ground or surface water quality adjacent to the private pond. Proper construction of private wells including extension of casing into the bedrock and thorough sealing of the annular space between the casing and the bore hole should prevent surface pollutants from entering the private wells.

Based upon the information provided by the engineer and the septic system design plans dated October 8, 2001 approval of the subdivision with respect to on-site sewage and private water supply systems would be supported. The preliminary plans prepared by Kenneth Hrica will have to be expanded at the time of request for building lot approval to provide the normal technical information required in the Public Health Code for septic system design. It is possible that other house and sewage disposal systems locations may be identified should a particular property owner elect not to place the house or septic system as shown on the preliminary subdivision plans.

## **The Natural Diversity Data Base**

The Natural Diversity Data Base maps and files have been reviewed regarding the project area. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

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 & 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.

## **Aquatic Resources**

### **Site Description and Aquatic Habitat Characteristics**

The 115.7 acre site of the proposed Litchfield Family Estates Subdivision contains an unnamed intermittent stream, a 1,000 foot reach of the West Branch Butternut Brook and an unnamed 8.5 acre pond.

The unnamed intermittent stream is contained in a channel of moderate grade. With substrate composed of small boulder, cobble, gravel, coarse sand, and sand-silt fines. Although it is reported to be intermittent, the stream contained flow the date of the property review.

The West Branch Butternut Brook is physically characteristic of a coldwater stream found in Connecticut. The stream transitions notably]y from a meandering wetland channel from the base of the unnamed pond dam to a moderate gradient channel with surface flow of moving pool interspersed by riffle and a substrate composed of boulder, cobble, gravel, coarse sand, and sand-silt fines.

The unnamed pond is artificial in nature and is the result of impounding the West Branch Butternut Brook. Bathymetric information for the pond is unavailable although it was informally suggested that the pond was between 6 to 12 feet in depth. Based upon field observations, it appears that the pond is relatively shallow given the moderate growth of emergent and submergent aquatic vegetation.

Dense growths of hardwoods and woody shrubs predominate as riparian vegetation and provide the unnamed stream and the West Branch Butternut Brook with a nearly complete canopy. Similar vegetation encompasses the pond

perimeter. Physical instream habitat is provided by the water depth in pools, undercut banks, and fallen or overhanging riparian vegetation. Physical habitat observed in the pond is composed of aquatic plant growth and fallen or overhanging perimeter vegetation.

Although residential has occurred, the drainage basin proximate the Litchfield Family Estates Subdivision remains primarily forested. The limited development to date provides a means of maintaining water quality of the West Branch Butternut Brook and the unnamed pond. The Department of Environmental Protection classifies these perennial waterbodies as Class AA surface waters. Designated uses for surface water of this classification are existing or potential public drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other purposes. Recreational uses may be restricted.

### **Aquatic Resources**

The unnamed intermittent stream is not anticipated to support viable populations of either fish or aquatic invertebrates.

Based upon channel grade, morphology, and substrate composition, the West Branch Butternut Brook can be classified as a coldwater resource. Although the stream on the Litchfield Family Estates Subdivision site was never subject to formal Inland Fisheries Division survey, it is anticipated to contain a fishery population of brook trout (*Salvelinus fontinalis*) and blacknose dace (*Rhinichthys atratulus*). These fish species are commonly associated with coldwater streams in Connecticut.

With a shallow water depth and moderate aquatic plant growth, the unnamed pond can be classified as a warm-water resource. Formal surveys have never been conducted to evaluate the resident fish population nor are there any records

available which document intentional fish liberation. The pond is anticipated to support bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*) golden shiner (*Notemigonus crysoleucas*) and brown bullhead (*Ameiurus nebulosus*). These fish species are common to warm-water lakes and ponds in Connecticut.

### **Impacts**

The Litchfield Family Estates Subdivision is to contain 10 house lots on the 115.7 acre site. The lots are reported to range in size from 2.0 to 25.32 acres in size. Four of the house lots will have access from Goodhouse Road with the remaining six being along a common gravel drive. That drive will require the crossing of the unnamed intermittent stream. Approximately 17.36 acres of the site will be maintained as open space. The open space will be protected by a conservation easement and will include the riparian area along the West Branch Butternut Brook and along the pond perimeter.

The siting of the house lots, utilizing permeable materials for the common drive and maintaining protected open space along the West Branch Butternut Brook and the unnamed pond should provide adequate safeguards to prevent adverse impacts to the site's aquatic habitats and resources.

### **Mitigative Recommendations**

The following recommendations are offered to further enhance and/or protect the aquatic habitats and resources found on the Litchfield Family Estates Subdivision site:

- The common drive crossing of the unnamed intermittent stream should be by arch culvert rather than the twin 24 inch diameter pipes currently proposed. The supporting elements of the arch (e.g., abutments, footings,

wingwalls) should be set landward of the streambank top of slope to eliminate the necessity of instream work or channel modification and to maintain all or a portion of the stream's riparian floodplain.

- The culvert installation should be scheduled for the time period of June 1 through September 30.
- Maintain, at a minimum, a 50 foot buffer zone of undisturbed habitat along the unnamed intermittent stream and a 25-50 foot buffer zone of undisturbed habitat around the perimeter of the unnamed pond. The buffer zone boundaries should be measured from either, (1 ) the edge of riparian inland wetland as determined by Connecticut inland wetland soil delineation methods or (2) in the absence of riparian wetlands, the edge of the stream bank based upon bank-full flow conditions. Research has indicated that a buffer zone of this width prevents damage to aquatic ecosystems that are supportive of diverse species assemblages. Buffers absorb surface runoff, and the pollutants they may carry, before they enter wetlands or surface waters. Please refer to the attached documentation presenting Fisheries Division policy and position regarding riparian buffers for additional information.
- Establish comprehensive erosion and sediment control plans with mitigative measures (haybales, silt fence, etc.) to be installed prior to and maintained through all development phases. Land clearing and other disturbance should be kept to a minimum with all disturbed areas being protected from storm events and restabilized in a timely manner.
- Limit liming, fertilizing, and the introduction of chemicals to developed land susceptible to runoff into the pond, streams or wetlands.

## **Wildlife Resources Review**

### **Existing Wildlife Habitats and Use**

This site is composed of hardwood forest interspersed with stands of conifers (softwoods), open water, forested wetland and riparian habitat. Species observed during the site visit are marked with an asterisk (\*).

Wildlife habitat is said to be the complex of vegetative and physical characteristics that provide for all the requirements of wildlife, that is food, shelter, resting, nesting and escape cover, water and space. Generally, the greater the habitat diversity and degree of interspersion of various habitat types, the greater the variety of wildlife there will be using an area. Conversely, while there may be fewer wildlife species, large unbroken expanses of one habitat type provide important habitat for many species of wildlife including species that avoid edges. For instance, some species of migratory birds, for which population declines have been noted, can only successfully nest in forest interiors well away from edges. Still other species need large expanses of grasslands or brushy shrublands. There are many factors to consider when determining habitat use and quality of an area for different species, including habitat types, size of habitat types and their quality, overall size of the study area, location, degree of isolation, diversity, and juxtaposition with other neighboring habitat types, etc.

The site is completely forested consisting of mixed hardwoods interspersed with conifer stands. The stream that feeds the 8-acre pond runs north to south and bisects the property. The property has numerous stone walls indicating historical agricultural use. Aerial photos show active agricultural land within close proximity of the property.



## **Hardwood Forest Habitat**

This site contains a mix of oaks, birches, cherries, beeches and maples, along with other species. There are also a lot of snags (dead or dying standing trees) available for wildlife use. Snags typically support large populations of insects and provide a great food source for birds like woodpeckers and chickadees. Snags are also easy for primary excavators like woodpeckers to create holes in for nesting. Cover value for wildlife is greatly enhanced not only by snags containing holes but also by large diameter den trees (live trees with a cavity caused by injury or disease). Species that use dens in trees include the barred owl, screech owl, tufted titmouse, white-breasted nuthatch, wood duck, chickadee, squirrel, raccoon and fisher, along with others.

Hardwood forests like the one on site also provide an abundance of food in the form of mast, berries, buds, insects, and catkins. Wildlife likely using the mature hardwood forest include scarlet tanager, white-breasted nuthatch, black-capped chickadee, black and white warbler, eastern wood-peewee, American redstart, downy woodpecker\*, barred owl, broad-winged hawk, and red-backed salamander. Mast produced by oaks provides excellent forage for a variety of animals such as white-tailed deer\*, gray squirrel\*, wild turkey, white-footed mouse and eastern chipmunk.

## **Coniferous Forest Habitat**

The site has small stands of conifers mixed in with the hardwoods. Areas of conifer or evergreen trees, such as hemlock and pine, provide food in the form of cones for squirrels, chipmunks and small mammals. They provide year round cover for songbirds, hawks, owls, turkeys, deer and many other species. This cover is of particular importance during the winter because it provides shelter from severe weather.

## **Forested Wetland Habitat**

Two wetland areas were identified during the site visit. The red maple swamp located along Goodhouse Road has standing water with numerous winterberry shrubs. Winterberry produces a berry that persists well into winter and is an important food source for birds and small mammals. This red maple swamp, with its sedge tussocks, shrub layer and canopy of mature trees provides a high degree of vertical diversity for wildlife. In general, the more vertical diversity a forest has, the more bird species there will be using the area.

The existing 8-acre pond was created by damming up a small stream. On the downstream side of the dike is a wetland area characterized by sedge tussocks, snag trees, shrubs (mountain laurel and winterberry) and over topping mature trees. The combination of open pockets of water and structurally diverse vegetation provides excellent food and cover for wildlife.

Forested wetlands (hardwood swamps) typically contain a mix of vegetation including sedge tussocks, herbaceous vegetation, shrubs and trees, interspersed with standing water, depending on the time of year. These areas produce an abundance of insects providing food for reptiles, amphibians, birds and bats. Many species of birds use forested wetlands at varying times of the year for breeding, feeding, and shelter. Examples include wood thrush, northern water thrush, common yellowthroat, and the eastern phoebe. Other wildlife likely using this habitat for food and cover are raccoons, star-nosed moles, wood frogs, pickerel frogs, spring peepers, gray tree frogs and eastern garter snakes.

## **Open Water Habitat**

The pond has a fairly good buffer of vegetation along its shores. There were some invasive species noted, such as multiflora rose (*Rosa multiflora*) and common reed (*Phragmites australis*). Invasive species are native (very limited cases) or

non native species that take over an area and choke out the native vegetation that should be growing there. These species often thrive in disturbed conditions and are very difficult to get rid of in most cases. They are typically of much less value to wildlife and tend to lower the overall plant diversity of an area. These invasive species should be controlled if quality wildlife habitat is to be conserved and should be controlled before they totally take over at a site.

Open water habitat provides a source of water for many species of wildlife and a roosting area for waterfowl. The buffer of vegetation around the pond is useful to waterfowl for nesting and as breeding habitat for amphibians and reptiles.

### **Riparian Habitat**

The stream that bisects the property (referred to as intermittent in the project report) is slow moving and fairly narrow. The associated riparian habitat is fairly dense (shrubby) but thins out in some areas.

Riparian habitat, or a greenway of trees, shrubs and herbaceous plants, that follows the edge of streams, rivers, lakes and ponds can provide habitat for many aquatic-based organisms such as frogs, salamanders, toads, ducks, herons, muskrat, otter and mink. The high vegetative diversity found along the edges of watercourses provides valuable cover and nesting sites for wildlife as well as a diverse source of berry producing shrubs and vegetation for foraging. Riparian zones can provide important travel corridors for wildlife by connecting larger areas of habitat together.

### **Wildlife Impacts**

#### Reduction in Available Habitat

The decrease in available forestland from the construction of the development could cause some wildlife species densities to decrease or species to disappear

from the site. Whenever a habitat type (forest, wetland, etc.) undergoes a permanent change such as development, it means there will be a change in the wildlife species that use the area. Species that specifically use forestland (forest specialists) will be replaced by species that can survive in a fragmented forested habitat interspersed with homes, lawns and driveways (generalist species). Generalist species are typically seen in suburban settings (American robin, American crow, Eastern coyote, red fox, skunk, and brown-headed cowbird). The reduction of forest will make the area less desirable for species such as American redstart, black and white warbler, hermit thrush, wood thrush, bobcat, mink, and otter.

### Increased Disturbance

The clearing of land, construction activities, and new roads will disrupt the contiguous forested nature of the area. Free roaming dogs and cats, traffic on the roads, and the increased human disturbance will cause less tolerant/adaptable species to move or decrease in number. The fragmentation caused by house lots will cause an increase in predation rates on songbirds birds using the remaining forested area by cats, crows, raccoons, skunks, etc. The construction of trails and continual human presence within the area will also disturb wildlife, especially during the spring and summer months.

### Wetland Impacts

Most of the development does not encroach upon wetlands, except for the wetland crossing of the common driveway. While the impact is limited because it is just one crossing, there is still a measurable impact. Placement of a culvert will require that some of the wetland be filled and wildlife using the stream as habitat and/or a travel corridor will be impacted to some degree. For larger streams bridge crossings are almost always more preferable than culverts to facilitate wetland crossings. Less fill is usually required and the bottom is left in a more natural state, which is much more desirable for wildlife. Also, wildlife

corridor use is less likely to be hindered by a bridge versus a small constricted culvert.

Alteration or degradation of the wetlands/riparian buffers will negatively affect the wildlife on the property and potentially downstream. Activities such as excessive cutting of vegetation around wetlands or siltation of streams can degrade these habitats and should be avoided during construction and after. After construction, runoff from the development containing commonly used chemicals such as fertilizers, pesticides, oils, etc. could impact the water quality of the stream and pond.

#### Pond Impacts

The closer homes, roads and lawns are to the pond, the greater the negative impact will be for wildlife using the pond area. At the site meeting, it was stated that each landowner would own a section of the pond. The existing vegetative buffer around the pond should be maintained in order to conserve the value of the pond for wildlife. Because it is very typical for people to want a manicured lawn right down to the water's edge, this should be accomplished through a deed restriction and/or homeowner association agreement.

The pond has an active beaver lodge and the beavers have a small dam built in the spillway of the pond. The homeowner association should be aware that the tree cutting will continue and potential flooding may occur due to the beavers blocking the outlet to the pond. The homeowner association should be advised that there are a range of options for dealing with the beaver, from tolerance and fencing off the trees to using the regulated beaver trapping season which runs from December 1st through March 15th. Please refer to the enclosed Wildlife Division Informational Series Sheet on Beavers for more information.

The dam that creates the pond has trees and shrubs growing up on it. The DEP's Dam Safety Unit recommends that earthen dams/dikes be free of woody

vegetation, which could compromise its structural integrity. Trees and shrubs should be cut and dams should be mowed regularly to deter woody vegetation. Dam safety issues should be directed to DEP Inland Water Resources Division, Dam Safety Unit (860) 424-3706.

### Open Space

The 17 acres of open space that will remain undeveloped will provide only a small relatively isolated tract of forest. The larger the open space, the more valuable it is for wildlife. Open space containing wetlands should be connected to uplands, since most wetland dependent species also require wetlands to fulfill their total habitat requirements. Wildlife habitat value for open space is greatly increased if it can be connected with other existing open space or conserved areas of wildlife habitat.

### **General Recommendations**

There are steps that should be considered when planning and constructing a development in order to help minimize adverse impacts on wildlife. It should be noted that despite these measures, wildlife habitat will increasingly be adversely impacted as the amount of development increases on a site (i.e. the less area cleared, the better, for wildlife).

- Clustered development should be encouraged to reduce the amount of land that has to be cleared. This practice also reduces fragmentation of forest habitat by keeping development confined to one area.
- Maintain a 100 foot (minimum) buffer of undisturbed natural vegetation around all wetland/riparian areas to filter sediment and potential pollutants from runoff, as well as provide valuable habitat for wildlife.
- During land clearing:
  - 1.) Leave as much of the existing native vegetation as possible.
  - 2.) Avoid cutting during the peak of bird nesting period (April 15 - July 15).

- 3.) Leave 3 to 4 snags (preferably 12 inches dbh or larger) per acre and 1 den tree (preferably 15 inches dbh or larger) per acre for use by birds and mammals for nesting, feeding and roosting.
  - 4.) Leave mast producing trees (i.e. oak, beech, hickory). A minimum of five oaks per acre, 14 dbh or greater.
  - 5.) Leave and encourage fruit producing trees/shrubs (i.e. winterberry, apple, viburnum).
  - 6.) Brush debris from tree clearing should be piled to provide cover for small mammals, birds, amphibians and reptiles when possible.
- Utilize natural landscaping techniques (avoiding lawns) to lessen the acreage of habitat loss. Implement "backyard habitat management" practices around houses/buildings to enhance wildlife habitat and wildlife viewing opportunities for homeowners. Landscaping these areas with native wildflowers, berry-producing shrubs and vines will attract numerous species of songbirds, small mammals and butterflies. More information on how to landscape backyards for wildlife can be obtained by contacting the DEP Urban Wildlife Program Biologist at (860) 675-8130.

## **Conclusion**

While limited in size, this site provides good forested habitat that is enhanced by the presence of the stream and pond. The site provides habitat for an array of species. Developing this area will lead to changes in habitat continuity and ultimately changes in the wildlife species using the area. The building of roads, driveways, homes and lawns will permanently fragment this area of forestland.

# WILDLIFE IN CONNECTICUT

## INFORMATIONAL SERIES

### BEAVER

*Castor canadensis*

#### Background Information

The beaver has played an important role in the ecological and cultural heritage of North America. For thousands of years beavers have created and enhanced wetlands across their range, benefiting a variety of wildlife species. Native Americans used beavers extensively for food, medicine and clothing. It was the value of the beaver pelt, created by high demand in Europe, that drove early trappers and fur traders to explore this country. The outposts they created became some of the earliest settlements and trading centers that helped spur settlement across the continent. Beaver pelts became a medium of exchange between Native Americans and settlers. Pelts were shipped to Europe where they were made into a high quality felt and fashioned into hats. The demand resulted in the intensive trapping and hunting of beavers. This unrestricted take of beavers, along with the deforestation that followed European colonization, eliminated the animal throughout much of its range in North America. However, with the establishment of wildlife laws in the early 1900s, the regrowth of forested habitats and subsequent restoration efforts by wildlife managers, beavers have made a remarkable recovery.

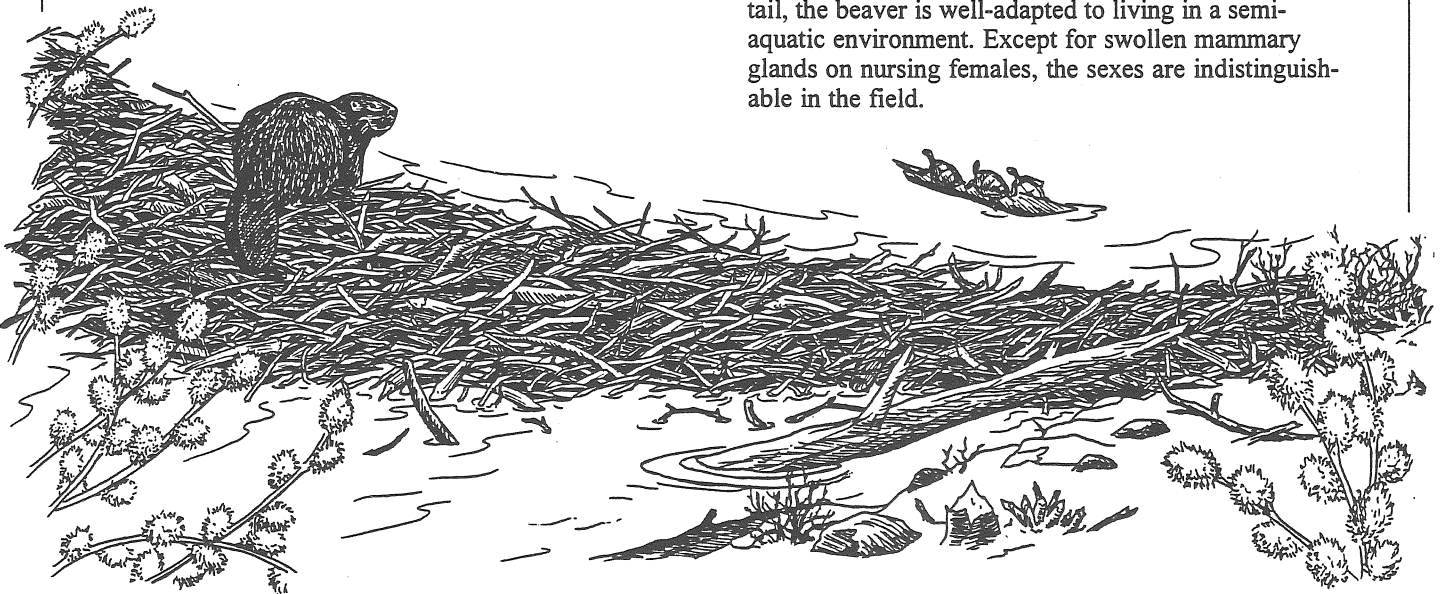
Beavers were common in Connecticut when the first colonists arrived. However, by the mid-1800s, with no regulations restricting when and how many beavers could be trapped, the species was extirpated from the

state. In 1914, a pair of beavers was relocated to Union in an effort to return beavers to Connecticut. By the 1950s, after additional releases, thriving beaver populations could be found in some areas of the state. Connecticut's beaver population was well established by 1961 when a regulated trapping season was instituted to address the growing number of beaver damage complaints.

The DEP Wildlife Division receives hundreds of complaints about beaver damage each year. This number is expected to increase as beaver populations continue to grow and human development encroaches on suitable habitat. Each year, more Connecticut citizens and communities are faced with the challenge of coexisting with beavers. This challenge involves efforts to minimize the problems beavers cause while also realizing the benefits of the wetlands these animals create and enhance. The Division's goal is to maintain a healthy beaver population at a level compatible with current land use patterns and available habitat.

#### Description

The beaver is the largest rodent found in North America. Adults can weigh anywhere between 30 to 65 pounds and measure from 24 to 36 inches, plus a tail of 12 to 18 inches. With its webbed hind feet with clawed toes, rich brown fur (which is both waterproof and insulating) and a unique, paddle-shaped, scaled, hairless tail, the beaver is well-adapted to living in a semi-aquatic environment. Except for swollen mammary glands on nursing females, the sexes are indistinguishable in the field.





## Range

The beaver's range includes most of the forested regions of North America, from Alaska across Canada, and as far south as central California, northern Nevada, northern Mexico, the Gulf coastal plain and extreme northern Florida.

## Habitat and Diet

Beavers can be found inhabiting rivers, streams, lakes, farm ponds, swamps and other wetland areas. They feed on the leaves, shoots, twigs, roots and outer bark of trees and shrubs. Preferred woody plants include aspen, willow, birch, ash, alder and apple, although beavers will use any type of tree or shrub species if preferred foods are scarce. A variety of aquatic plants, like water lilies and pond weeds, and other plants, like sedges and grasses, are consumed during summer.



## Life History

Beavers are monogamous, having only one mate during the breeding season and often for life. Breeding occurs in midwinter and, after a gestation period of 100 to 110 days, a single litter of two to five kits is born in May or early June. At birth, the kits are well-furred and possess fully developed teeth. At two to three weeks of age they begin to eat vegetation and are weaned by about six weeks. The young remain with the adults as a family group or colony until their second year. At that time, the adults drive the young beavers out of the territory, forcing them to migrate and search for mates and unoccupied habitat in which to establish a new colony.

## Habits

Beavers are best known for their unique dam-building ability, which enables them to modify the habitat to meet their needs. By cutting sticks and branches and shoving them into the stream bottom and then piling mud and other debris on top, beavers are able to dam a stream and create a pond, or beaver flowage. The flowage

provides beavers access to food and protection from terrestrial predators. Water in the flowage must be deep enough to provide a zone of unfrozen water below winter ice. Beavers may also try to dam the outlets of man-made ponds and lakes. They create dams through instinct and in response to the sound and, to a lesser extent, the motion of running water.

A dome- or teepee-shaped lodge is constructed by beavers out of sticks and mud within the wetland, upstream from the dam. The lodge contains a dry inside chamber which provides cover from the elements and a place to raise young. There are usually several underwater entrances to the lodge. Beavers also may build dens along rivers by digging underneath overhanging root masses or into the bank. The entrance to a bank den may be covered with sticks and mud.

Beavers are active year round. They are mainly nocturnal, but are sometimes observed during daytime. Activity is concentrated in the vicinity of the lodge and dam, but, if necessary, beavers may travel several hundred feet from the water in search of food and materials for lodge and dam maintenance. In the fall, a cache, or feed bed, is usually placed just outside of the lodge by anchoring sticks and branches in the muddy bottom. The beavers will feed on this food supply during winter when the pond or flowage is iced over.

Territorial by nature, beavers will not tolerate other beavers within their colony's home range. An established colony in midwinter typically is comprised of an adult pair, two to four kits and two to four yearlings (18 months old). Established colonies are occasionally forced to move if their food supply is depleted, but this may take many years, depending on the amount of food available to the colony.

## Interesting Facts

Beavers use their tail as a support when standing, a rudder when swimming and a warning device for other beavers when slapped on the water. Fat also is stored in the tail to provide a beaver with energy during winter.

When under water, thin membranes protect the beaver's eyes and internal valves automatically close within the ears and nose. The lips seal tightly around the incisors, an adaptation for feeding underwater. Like all rodents, a beaver's incisors constantly grow.

Beavers have a pair of large scent glands, located near the anus, which produce castoreum oil that they deposit on scent mounds. Castoreum oil has been used as an ingredient in some perfumes. Another pair of glands near the abdomen secretes an oil that is used in grooming. A specialized toenail on each hind foot acts as a comb to spread the oil over the fur. Pelts are considered prime during winter, when the fur is thickest and most valuable. Today, pelts are used in making coats, hats, blankets and other accessory garments, and the meat is sometimes consumed by those who trap beavers.

## Benefits

Beaver ponds and their associated wetlands provide habitat for a wide variety of animals, such as insects, spiders, frogs, salamanders, turtles, fish, ducks, rails, bitterns, flycatchers, owls, mink and otters. Dead standing trees killed by flooding provide preferred nesting habitat for colonies of great blue herons and cavity-nesting birds, such as the wood duck and hooded merganser. Beaver ponds also filter and trap sediments and excess nutrients, serve as water storage and recharge areas, and provide opportunities for canoeing, fishing, wildlife observation and waterfowl hunting.

## Beaver/Human Conflicts

Beaver/human conflicts have been increasing in recent years due to human encroachment on wildlife habitat and a growing and expanding beaver population. Because beavers have the ability to build dams to impound water, they can dramatically alter the environment in which they live. The problems beavers can cause fall into two main categories, tree cutting and flooding. In some cases, beaver activity can threaten property, agricultural crops or public health and safety.

Beaver dams also may negatively affect other natural resources. For example, dams can serve as barriers to migrating fish and cause inundation and siltation of rare plant and animal habitats.

There are also instances when landowners are unwilling to tolerate any beaver activity on or near their property. Unfortunately, there are no known repellents that are effective against beavers and harassment generally does not cause beavers to abandon a site. In rare instances, such as when a young beaver has not established a territory, continual removal of dam material may persuade it to abandon the site (see **Breaching of Dams**).

In an effort to assist landowners with beaver conflicts, following are descriptions of a number of options that may help alleviate problems caused by beavers.

**Tolerance:** In many instances, people experience relatively insignificant beaver damage, such as the cutting of trees around a pond or lake or the flooding of an existing wetland area. The beavers are simply doing what is natural and tolerating that activity is part of coexisting with wildlife. The changes that occur when beavers flood an existing wetland, dam a stream or flood standing trees may be aesthetically unpleasant to landowners. However, people should realize that wetlands are dynamic systems that change over time. The Wildlife Division encourages landowners to develop a tolerance and appreciation of beavers and the benefits they provide for wildlife and humans alike.

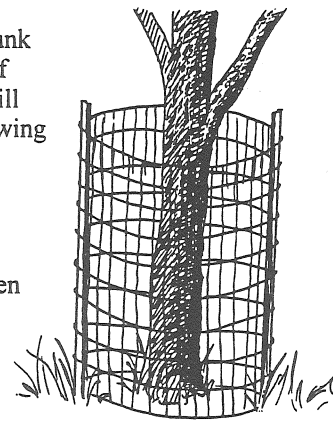
**Protecting Trees and Shrubs:** The most effective way to protect trees and shrubs from being cut by beavers is to place heavy-gauge fencing with a mesh opening of no more than 2-inch x 4-inch around the base of the plant,

six inches away from the trunk and extending to a height of four feet. (Chicken wire will not deter the powerful chewing of beavers.)

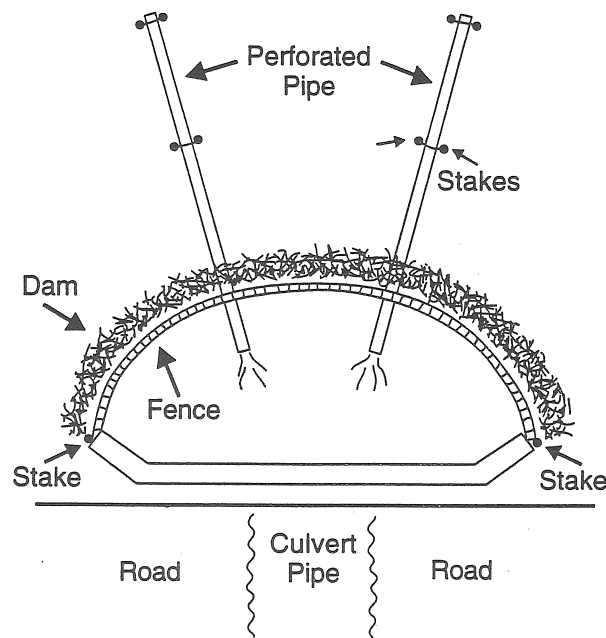
**Exclusion Fencing at Culverts\*:** In many cases, beavers cause flooding of roads and adjacent land when they directly plug a culvert. In some cases, this can be prevented by staking a strong woven wire fence, 10 to 15

feet in front of the culvert, which physically prevents the beavers from accessing and plugging the culvert. Ideally, the beavers build a new dam against the fence and the culvert remains open and continues draining water that spills over and through the fence and beaver dam. Factors such as water depth, topography and wetland substrate need to be assessed before placing a fence in front of a culvert.

**Water Level Control Devices\*:** In certain situations a water level control device (WLCD) may be effective in reducing flooding to a tolerable level for landowners while maintaining suitable beaver habitat. "Water level control device" is a term used for any device placed through a beaver dam to drain water from the flowage. Plastic perforated pipes, wooden boxes with mesh bottoms, perforated aluminum culverts and culverts made from layers of mesh are all types of WLCDs.



## Combination Exclusion Fencing and Beaver Pipes



A WLCD minimizes the sound and motion of running water. Ideally, beavers can continue their activities but should not be able to plug the device. Therefore, water can still pass through the device, resulting in a lower water level. The proper installation and maintenance of WLCDs are critical to their success. It is important that entrances to the lodge remain under water and a minimum water depth be maintained to provide sufficient habitat for the beavers if the wetland freezes during winter. Also, landowners must still be willing to tolerate some flooding, especially during storm events.

Control devices are not useful in all situations. Topography, depth of the water behind the dam, number of potential dam sites and watershed size must be considered when determining the applicability of WLCDs. Their use may address a site specific problem, however, the overall beaver population is not reduced.

In certain situations WLCDs can be used in conjunction with fencing to exclude beavers from a culvert and also regulate the water level.

**Breaching of Dams\*:** Beaver dams may be breached when water needs to be drained from a site prior to dam removal, before WLCDs or exclusion fencing are installed or to temporarily relieve flooding that cannot be tolerated. If breaching is done as an interim measure to relieve flooding until the beavers are harvested during the trapping season, it will need to be done on a regular basis because the beavers will rebuild the dam each night. The breaching of dams should only be undertaken when a more effective solution is not currently possible, as there can be negative environmental consequences, including the alteration of wildlife habitat, downstream siltation and erosion. Breaching should be done with extreme caution due to the possibility of downstream flooding and damage.

**\*The installation of any water level control device at a culvert or modification of a beaver dam in any way, including breaching or removal, are considered regulated wetland activities and must be approved by the local inland wetlands commission. All installations require regular maintenance.**

**Trapping:** In situations when the presence of beavers cannot be tolerated or the landowner wishes to control the number of beavers on his property, trapping during the regulated winter trapping season is the most effective solution (consult the current Connecticut Hunting and Trapping Guide for trapping season information). Licensed trappers will often voluntarily

assist landowners by harvesting beaver during the trapping season.

The results of the trapping season are monitored by a mandatory pelt-tagging program. The season dates are established to harvest beavers at a time of the year when the fur is of greatest value, thus managing the population as a renewable natural resource. Special authorizations to trap beaver outside of the regulated season may be issued by the DEP Wildlife Division when beaver activity threatens public health and safety or causes damage to agricultural crops.

## Population Management

Removing nuisance beavers by live-trapping is not considered a viable option for alleviating beaver problems in Connecticut. This costly technique only serves to move a problem from one site to another. In addition, there are few unoccupied areas where beavers can be moved and not cause another problem. Relocated animals seldom stay in the area where they are released. Most importantly, moving beavers does not reduce the overall beaver population and, thus, does not reduce the number of complaints and damage.

While exclusion fencing and WLCDs may remedy site-specific beaver problems, these techniques will not curb beaver population growth. In Connecticut, there is little natural predation or disease to control beaver populations. Bobcat, coyote, otter and mink may prey on beaver kits and, occasionally on adults, but natural predation does little to reduce the overall population of beavers. Some beavers are hit by vehicles or die due to natural accidents, injuries or disease, but none of these sources of mortality are significant. Historically, the Eastern timber wolf was considered a major predator of beavers. However, wolves were extirpated shortly after the arrival of the colonists and are not likely to return to the highly-developed eastern landscape. Today, humans remain the primary predator of beavers and, thus, the main factor controlling their population growth. The annual removal of beavers during the regulated trapping season is the best long-term solution to maintaining a balance between beaver populations, suitable beaver habitat throughout the state and human land uses.

The DEP Wildlife Division provides technical assistance to individuals experiencing problems associated with beaver activity. The options available will depend on the time of the year and the nature and severity of the problem. For more information, contact the Wildlife Division at (860) 295-9523 (Eastern Connecticut) or 860-675-8130 (Western Connecticut).



*The Technical Assistance Informational Series is 75 percent funded by Federal Aid in Wildlife Program. This program provides funding through an excise tax on the sale of sporting firearms, ammunition, and archery equipment. The remaining 25 percent of the funding is matched by the Connecticut Wildlife Division.*

## **Planning Considerations**

### **Consistency of Project with State and Regional Plans**

The Connecticut Conservation and Development Policies Plan, 1998-2003 classifies the subject site as a "Conservation Area". The State Plan encourages comparatively low density development in "Conservation Areas" in order to "plan and manage, for the long term benefit, the lands contributing to the state's need for food, fiber, water and other resources, open space, recreation, and environmental quality and ensure that changes in use are compatible with the identified conservation values." The subject site is classified as a "Conservation Area" because it is located within a potential public water supply watershed (Butternut Brook watershed) according to the CT Department of Environmental Protection.

The Growth Policy Map of the Litchfield Hills Council of Elected Officials classifies the subject site as a "Rural Area" and "Sensitive Resource Area". Densities even less than the minimums needed to sustain on-site sewage disposal and well systems are reasonable in these areas in order to protect sensitive resource areas and channel growth to less remote locations.

The proposed project is generally consistent with the density of development envisioned in these advisory regional and state policy plans. Since this is a potential public water supply watershed, however, particular care is warranted during project planning and implementation to minimize any potential impacts to water quality.

## **Design Considerations**

Based on a preliminary review, the proposed access to the new lots appears to be well designed. The two shared driveways will serve to reduce the number of new curb cuts on Goodhouse Road, thus helping to maintain roadway capacity and the scenic character of the streetscape. The proposed common drive (Hidden Pond Lane) generally follows existing contours, and the proposed gravel surface for this common driveway will serve to protect the rural character of this attractive woodland area.

Consideration should be given to relocating the proposed 20 foot easement to the pond from Goodhouse Road due to limited sightlines to the north and potential wetland impacts. It appears that there are opportunities to enhance sightline distances and reduce potential wetland impacts by relocating this easement to the south.

The subdivision plan calls for prohibiting the use of fertilizer on lawns. This will serve to protect water quality. Consideration should also be given to restricting the amount of lawn that can be created adjacent to the pond in order to further protect water quality and the natural appearance of the pond.

Many of the proposed housing units have a direct southern exposure along the roof line which is particularly attractive for solar design. Consideration should be given to incorporating passive solar design principals into the project where feasible.

The subdivision plan calls for permanently protecting 17 acres of the 115-acre site as open space. This land is located in the southwest corner of the property and is predominantly wetlands. No public access would be provided to the parcel, and there are no protected properties abutting this land which would enhance its open space value.

According to the applicant during the ERT field review, the purpose of this open space set-aside is to protect the Butternut Brook wetland corridor, and there are no plans for passive recreational use or enhancement of this land proposed for protection. While protection of this open space is desirable, the wetlands on the property already severely limit development potential. Without public access to this parcel, the Litchfield Planning and Zoning Commission may wish to seek a fee in lieu of this open space in order to acquire a more significant or usable open space parcel in the community. Another option that may wish to be considered is extending the 20 foot easement from Goodhouse Road along the southern border of the pond to connect with the existing trail at the southern end of the pond. This would facilitate access to the open space, and provide a pleasant walking, trail for enjoyment of the pond.

## **Archaeological Review**

A review of the State of Connecticut Archaeological Site files and maps show no known archaeological resources in the project area. However, our files do show three historic Euroamerican farmsteads and industrial sites in close proximity. These sites date to the early settler's use of land in the 18th and 19th centuries. In addition, the Milton Center Historic District is within a quarter of a mile from the project area.

The Office of State Archaeology recommends any stone ruins associated with the project area be avoided when feasible. Stonewalls and other ruins that will be affected by construction activities should be mapped and photo-documented prior to removal. The Office of State Archaeology is prepared to provide any technical assistance in conducting the recommended mapping and photographing.

# **Appendix A**

## **Soils Information**

For Appendix Information Please Contact the ERT  
Office at 860-345-3977