



Verplanck Elementary School Outdoor Classroom and Nature Trail

Manchester, Connecticut

Eastern Connecticut Environmental Review Team Report

**Eastern Connecticut
Resource Conservation and Development Area, Inc.**

**Verplanck School
Nature Preserve,
Outdoor Classroom and Nature Trail
Manchester, Connecticut**

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team
of the Eastern Connecticut
Resource Conservation and Development Area, Inc.

for the
General Manager and
Hockanum River Linear Park Committee
Manchester, Connecticut

October 1997

CT Environmental Review Teams
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Haddam, CT 06442
(860) 345-3977

Acknowledgments

This report is an outgrowth of a request from the Manchester General Manger and the Hockanum River Linear Park Committee to the Hartford County Soil and Water Conservation District (SWCD). The SWCD referred this request to the Eastern Connecticut Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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

The field review took place on Tuesday, June 24, 1997.

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I would also like to thank Doug Smith, Glenn Cornish, and John Iagrossi of the Hockanum River Committee, Lynn Rhodes, Alexis Keichel, and Eileen Griffin of Verplanck Elementary School, Ronald Schauster from Empire Tool and Manufacturing Company and Deborah Lee of the Eastern CT RC&D Area Executive Council 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. During the field review Team members were given additional information. 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 landowner. This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the Town and applicant. 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 continuing to develop and construct the nature preserve and trails and in providing educational programs for students and adults.

If you require additional information please contact:

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Introduction

Introduction

The Manchester General Manager and the Hockanum River Linear Park Committee, a sub-committee of the Manchester Conservation Commission, have requested assistance from the Eastern Connecticut Environmental Review Team in conducting an environmental review and natural resource inventory of the Verplanck School Nature Preserve and Outdoor Classroom and Trail.

The ±40 acre parcel of open space is located adjacent to Olcott Street and Love Lane and abuts the Laurel Marsh Hiking Trail system of the Hockanum River Linear Park. The Verplanck School Nature Preserve contains a 3/4 mile hiking trail from the school, across the rear of the Empire Tool Company, along Hop Brook on CL&P property, across Olcott Street and along Love Lane to the Laurel Marsh Trail. The Verplanck School Trail is a dirt trail that has +300 feet of wooden boardwalk, benches and an outdoor classroom area.

Objectives of the ERT Study

The ERT has been requested to provide more detailed information about this parcel's natural and cultural resources so that they may be incorporated into the elementary school curriculum and to enhance the experience and knowledge of the public using the trails and preserve.

The Committee has asked for specific information concerning placement of a deck overlooking Hop Brook for eventual water quality testing and fish and insect observation, habitat enhancements, educational opportunities and management guidelines.

The ERT Process

Through the efforts of the Town and Park Committee this environmental review and report was prepared for the Town of Manchester.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested. 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 on June 24, 1997, and various Team members also made separate and/or additional field visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

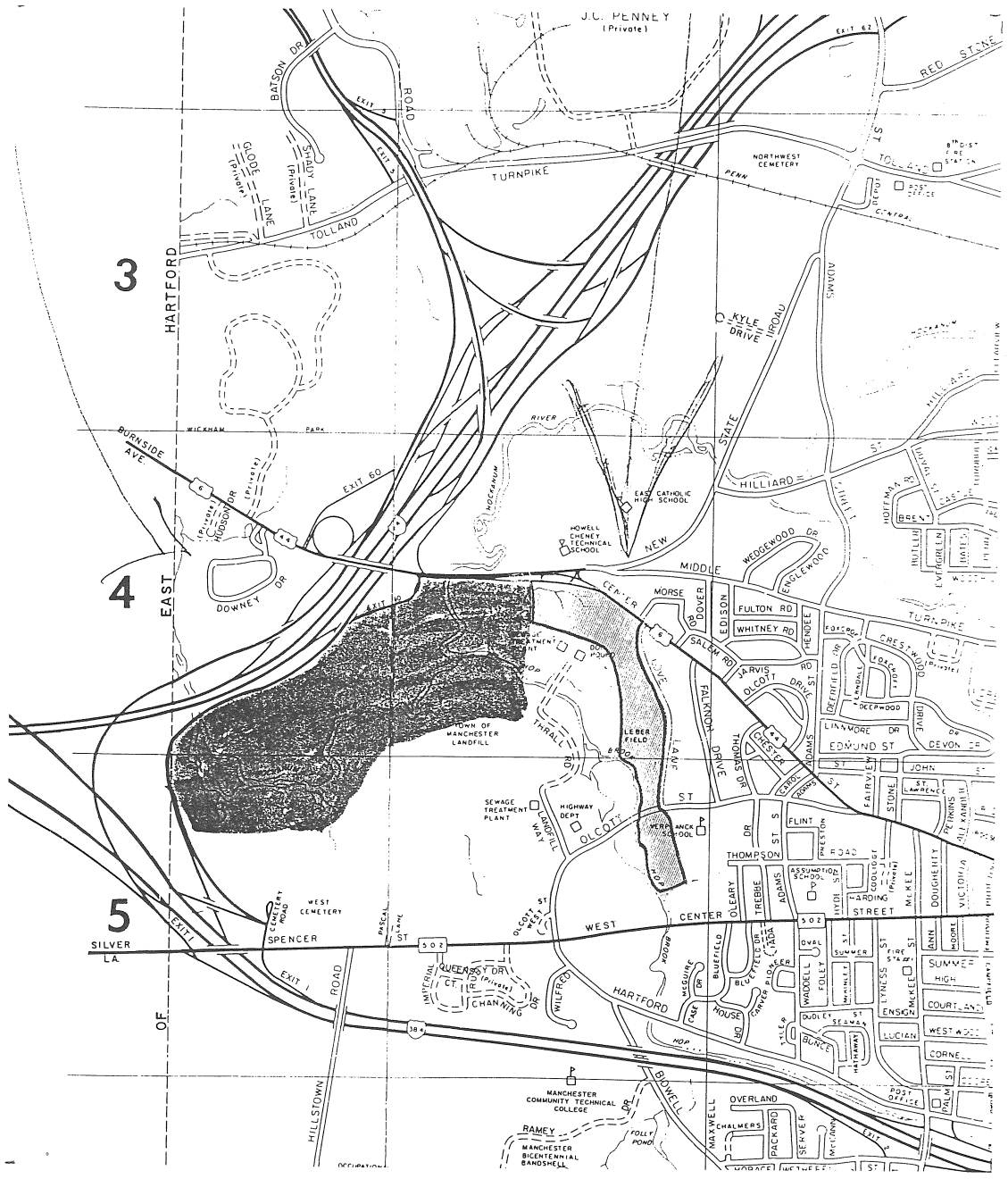
Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.



General Location Map



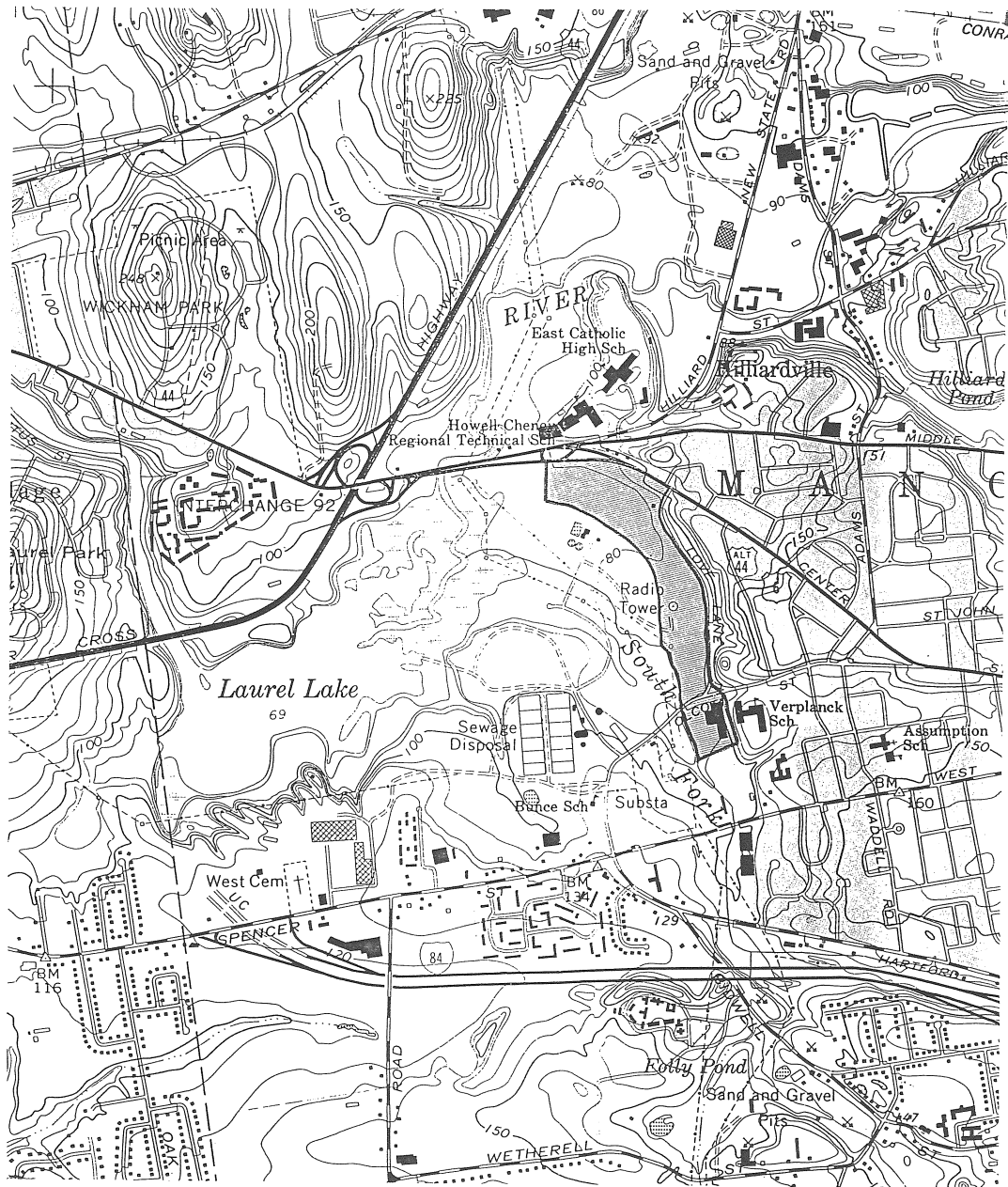
Verplanck School Nature Preserve and Hop Brook Trail
Laurel Marsh 1989 ERT Report Study Area





Topographic Map

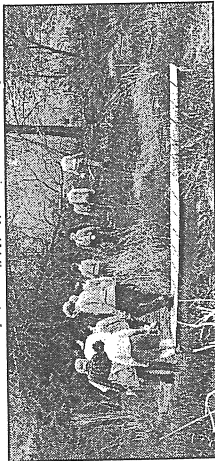
Scale 1" = 1320'



The Laurel Marsh Hiking Trail

This brochure was prepared by the Hockanum River Linear Park Committee, Manchester, Connecticut, 203-647-3130 - Sept. 95.

TRAIL DISTANCE - 3.5 MILES



This trail and four others along the river are maintained by the Hockanum River Linear Park Committee which is a sub-committee of the Manchester Conservation Commission. Anyone is welcome to join.

Parking is at the West End Parking Lot of the Cheney Technical School, 791 West Middle Turnpike. The hiking trail starts across the street and to the west of the lot, entering the woods at the green sign "Hockanum River Hiking Trail". The trail then turns right and follows orange blazes to the river and then downstream along river. Green and white signs identify a variety of trees in English and Latin on the entire length of this trail. Some of the trees include Swamp White Oak, Red Oak, White Pine, Eastern Cottonwood, Sugar Maple, Pignut Hickory, Shagbark Hickory, American Beech, Black Cherry, Yellow Birch and others.

The trail traverses a large open marshland formerly the bed of Laurel Lake before the dam in East Hartford was removed 30 yrs ago

This extensive length of relatively flat marshland trail is excellent for cross country skiing in winter. Several small footbridges cross tributary brooks that enter the river.

The Laurel Marsh Trail extends through a wide variety of environments - upland forest, meadow, marshland and flood plain - each with its own unique vegetation - hardwoods in the uplands, cottonwoods and gray birch in the floodplains, various kinds of grasses including the giant reed (phragmites) and cattails.

The trail follows the north side of Hop Brook to the new sewage treatment plant, crosses the brook on a paved road then follows the brook downstream into a woodland. Beyond is a long section of trail through marsh and meadow along the river close at one point to the Town landfill. The trail passes through several stands of phragmites, over several footbridges and raised walkways. Then the trail climbs a slope into a deciduous woodland with a large stand of Pin Cherries noted for their red bark. This is an area that was timbered for hardwood and pine lumber several years ago. The trail curves on the slope of deciduous and coniferous forest and wetland passing several very large White Pines. The trail then comes out into an open area, around a sediment basin and along I - 384 on a gravel path. Extensive numbers of White Pine seedlings have been planted by the Committee here.

The trail then enters a woodland, passes next under three I-84 highway bridges on a paved bikeway. This bikeway then goes over the river. Watch for the orange blazes and opening in the fence to follow the trail down to the river under the 3 bridges again and into the woods to the marsh. The trail follows the shoreline of the original Lake in the forest to a high point with a fine view of the entire marsh.

This high point may have been the site of an early Podunk Indian village. The path continues along the old shoreline past magnificent Beech trees and Mountain Laurel. More tree identification signs.

Some of the birds seen on this trail are egrets, mallard ducks, great blue herons, kingfishers, hawks and crows. Animals in this Laurel Marsh and woodland area are deer, woodchucks, racoons, muskrats, voles, field mice and rabbits.

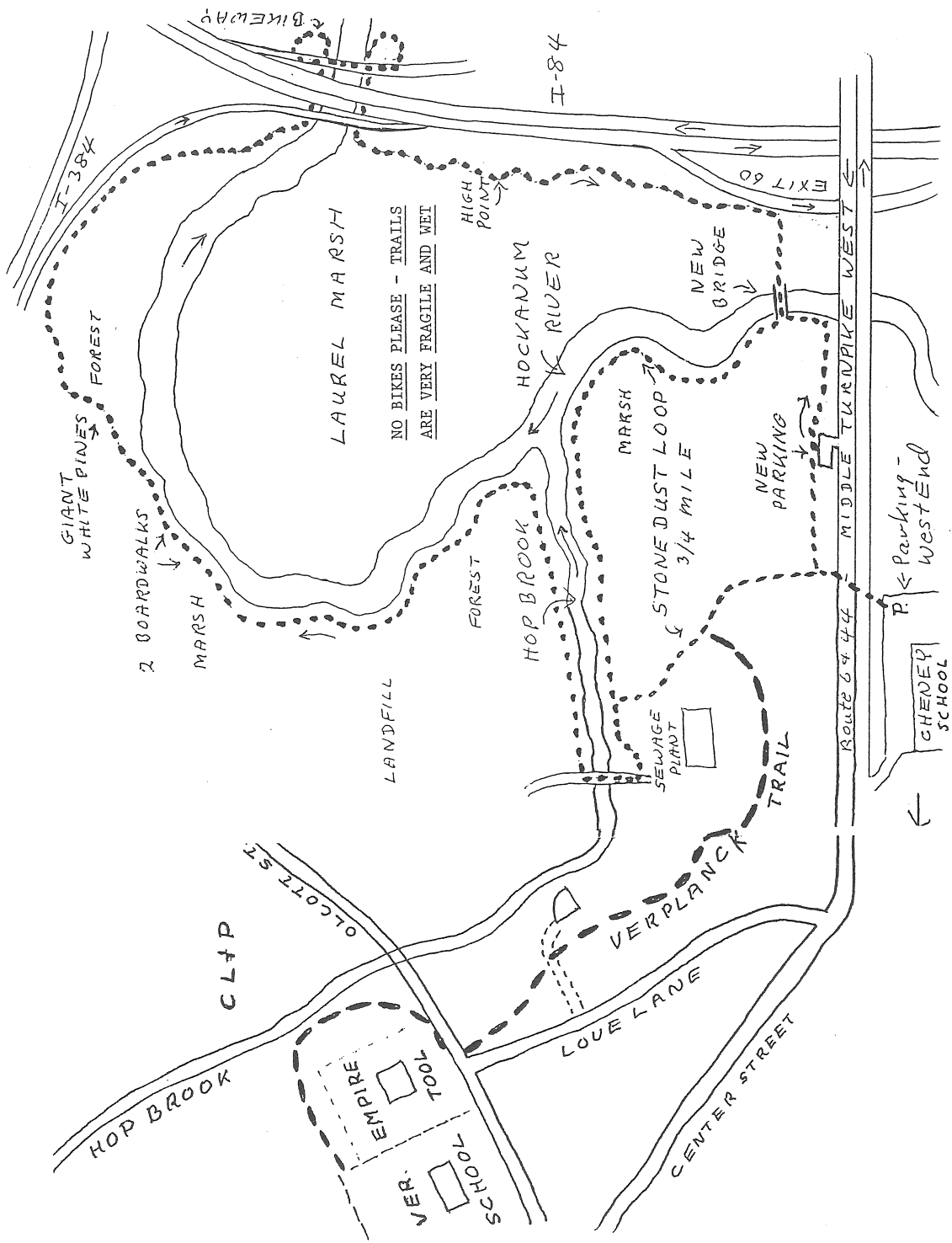
Following the orange blazes the trail opens out onto the gravel path next to exit 60 off I-84 where more White Pine seedlings were planted 2 years ago. The route back to Cheney Technical School is east along a new boardwalk and across the new steel bridge over the river.

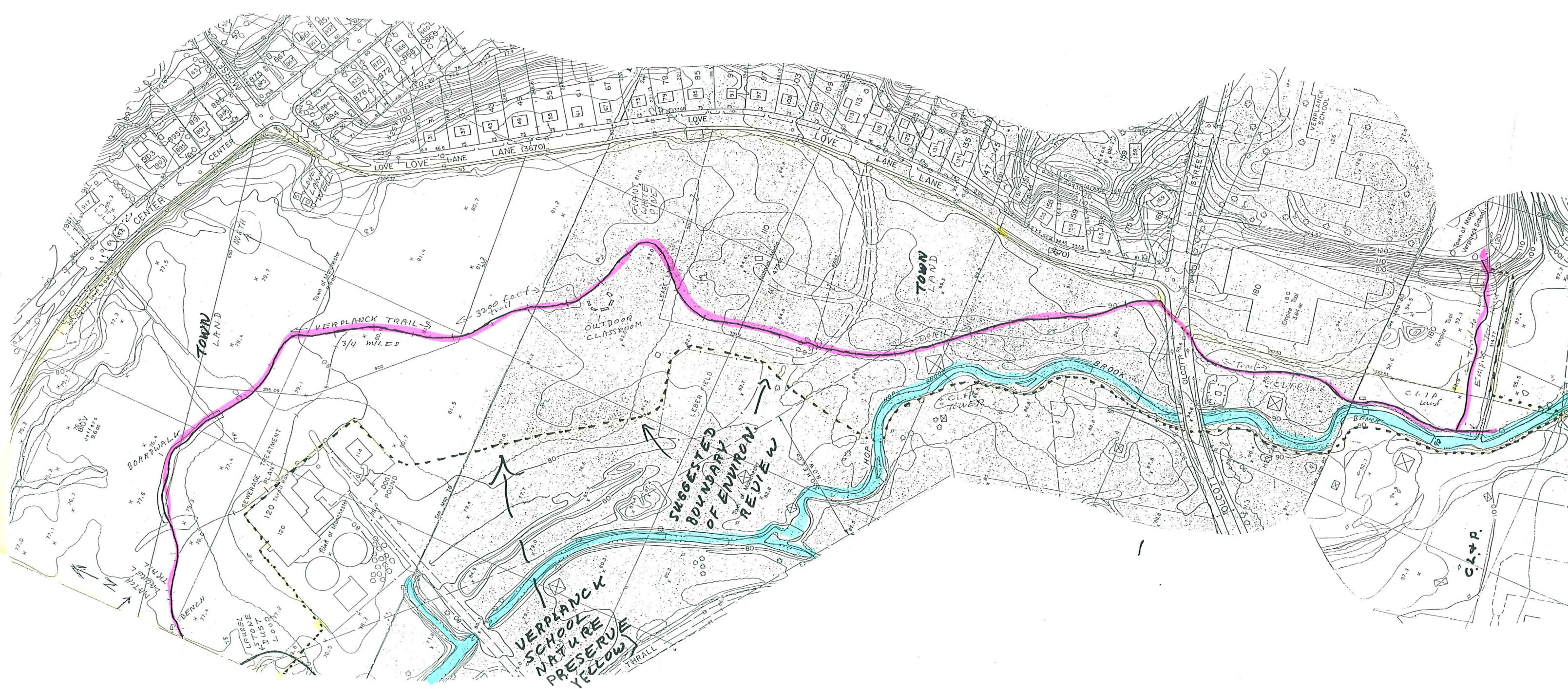
A State grant has provided funds for improvements to the hiking trail system around Laurel Marsh. There is now a new parking lot next to the phone booth on the south side of Middle Turnpike West, a new 3/4 mile stone dust accessible loop trail, several boardwalks, an arched steel bridge over the Hockanum River.

Over the past 20 years this trail and 4 others have been cleared, maintained and improved by the Hockanum River Linear Park Committee volunteers. The steps, bridges, raised walkways and stiles are some of the Committee's accomplishments.

Guided public walks are held on some third Sundays at 1 p.m. See area newspapers for dates.

For information please call the Town Hall at 647-3130 or the Recreation Department at 647-3084. If you wish to be active on the Committee - call 649-5678 evenings.





Soil Resources

Soils

The Hartford County Soil Survey provides adequate mapping for the planning and educational purposes of this project. There may be some additional areas of made land associated with the construction of Love Lane and the Public Works facilities in the area. Most of this disturbance has taken place in the upland soils area due to the restrictive nature of the wetland soils.

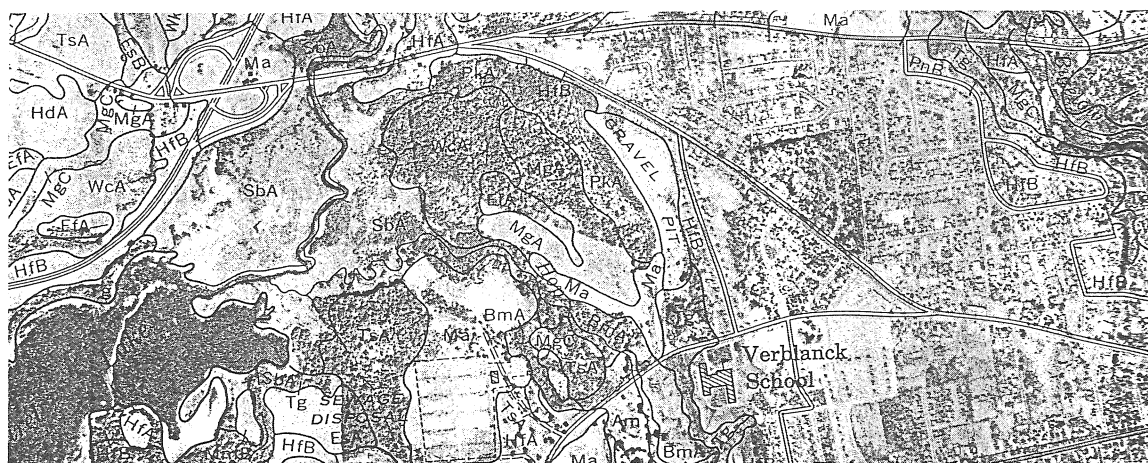
The following soils types are found on the site:

- Am Alluvial land - may be well drained to poorly drained*
- BmA Bowmansville silt loam - poorly drained*
- HfA Hartford sandy loam - moderate to well-drained
- Ma Made land
- MgA Manchester gravelly sandy loam - excessively well-drained
- PkA Peats and Mucks - very poorly drained*
- Tg Terrace escarpment, sand and gravel - well drained land form
- WcA Walpole loam - poorly drained*

All soils marked with an (*) are considered wetland soils as defined by Connecticut state statutes. This site exemplifies the complexity of soils in the area due to glaciation including the effects of Glacial Lake Hitchcock.

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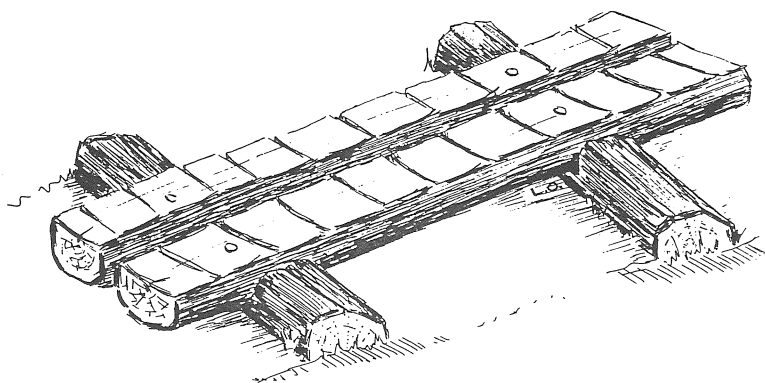
Soils Map



Soils and Trail Use and Construction

In general the site is fairly level and the existing trail system follows an easy grade. There is not a great concern about water erosion along the trail. Routine maintenance should address any minor erosion problems. There are several areas, however, where the trail does encounter wetland soils and/or an intermittent watercourse. As often happens, the trail becomes wider in such an area as hikers try to find the driest way around the wet spot. A boardwalk has been built in the larger wetland which allows for access into the area with little disturbance. It is evident that additional wooden structures are needed in other isolated areas along the trail leading from the school. Both the school and Hockanum River Linear Park Committee are aware of this need. If it has not already been addressed, plans should be made to do so.

Trails that provide access into wetland and other sensitive areas should be properly maintained to keep hikers on the trail. Additionally, part of the educational program should be proper trail etiquette. These include but are not limited to: 1) staying on the trail, 2) walking single file unless the trail is designed to accommodate more, 3) no littering, 4) no picking or disturbance of plant species, 5) keeping noise to a minimum and 6) taking out all that you brought in. Lessons planned that include off-trail studies should encourage students to disperse to reduce impact and walk lightly. Rotating use of off-trail sites helps to minimize trampling of plant species and compaction of soils.



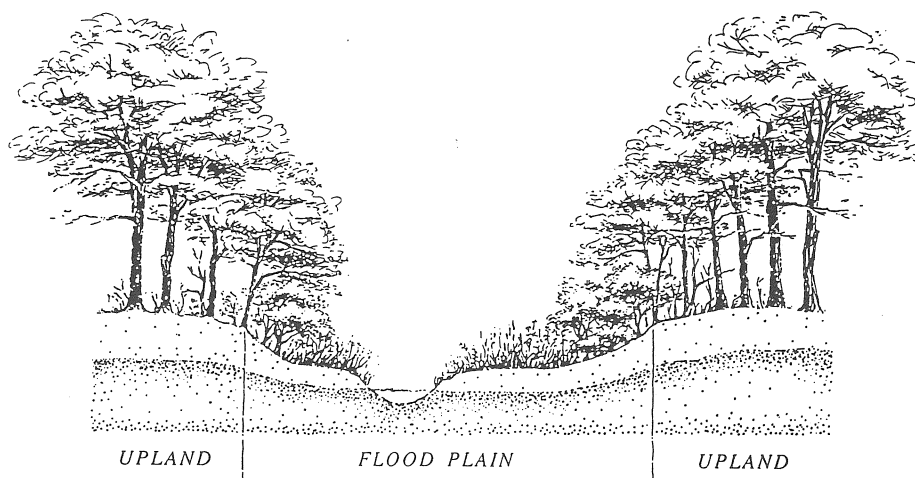
Soils Education

Soil is a dynamic resource that is often overlooked in science education. Understanding soils in relation to other natural resources, however, is important to any environmental curriculum. The diversity of soil types on the site lend themselves well to the educational intent of the Verplanck trail system. Teachers and students can observe differences in soil textures and drainage classifications all within a very short distance. Project Wet and Project Learning Tree both have soil lessons that could be used on this site.

Soils in Connecticut are a product of glaciation that took place here some 10,000 years ago. Educators can begin their soils lesson by taking a look at the geologic history of Connecticut, including the glacial period and the subsequent development of some of the best farmland in the world. The fertile soils in the Connecticut Valley, including Manchester, played an important role in both pre- and post- European history. Teachers can easily expand soils education beyond the science arena and into the areas of history, economics, and archaeology.

Inland wetlands are unique ecosystems that are defined by soil type in Connecticut. There are several areas on the site that may also function as vernal pools. Making such a determination and subsequently following up with field studies in late March through April would make an exciting and interesting lesson.

In Fall 1996, teachers at the Verplanck School participated in an eight-hour training program on Project Wet. Additional teacher training could take place with using either Project Wet or Project Learning Tree. Activities from these two programs could be easily integrated into the outdoor classroom setting.



Recommended references for the library:

Bell, Michael. *The Face of Connecticut*. 1985. State Geological and Natural History Survey of Connecticut. Bulletin 110.

Metzler, Kenneth J. and Tiner, Ralph W. *Wetlands of Connecticut*. 1991. State Geological and Natural History Survey of Connecticut.

Donohue, Daniel F. *A Guide to the Identification and Protection of Vernal Pool Wetlands of Connecticut*. circa 1996. University of Connecticut Cooperative Extension System, Connecticut Forest Stewardship Program.

Kenney, Leo P. *Wicked Big Puddles - A guide to the study and certification of vernal pools*. September 1995. U.S. Government Printing Office for U.S. Environmental Protection Agency - Region 1.

For further information on soils and/or soils education and materials contact:

Hartford County Soil and Water Conservation District
627 River Street
Windsor CT 06095
(860) 688-7725

or

USDA Natural Resources Conservation Service
16 Professional Park Road
Storrs, CT 0626
(860) 487-4011

Geology and Hydrogeology

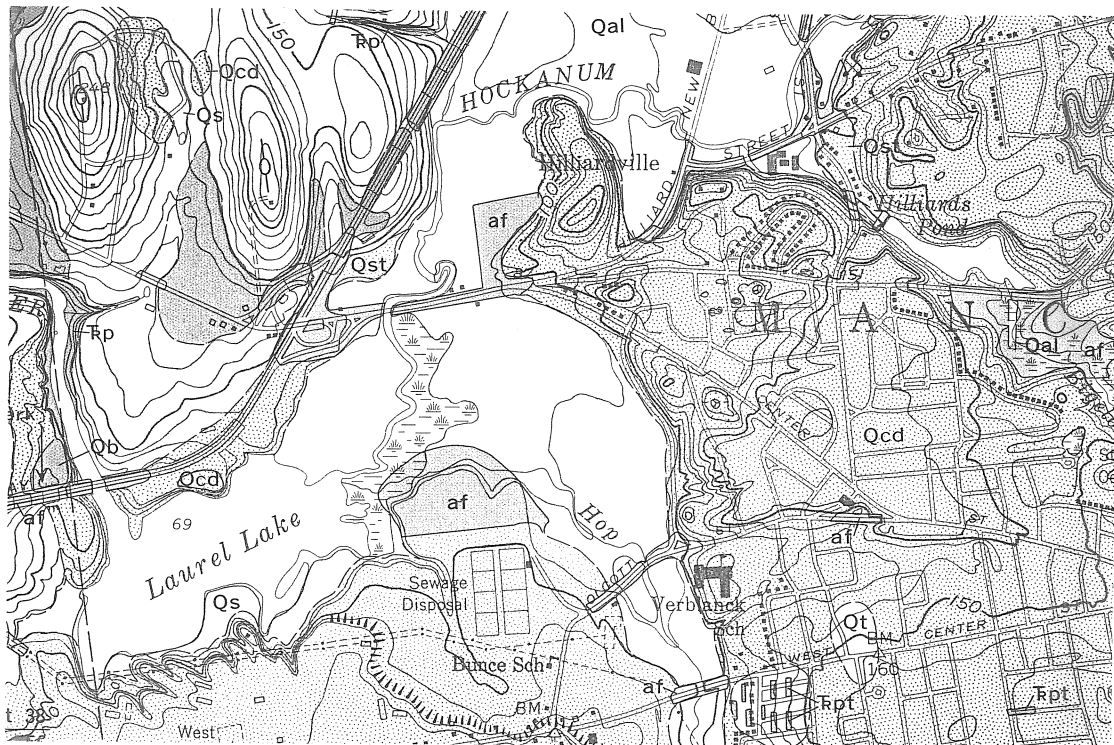
Introduction

Although not exposed the bedrock underlying the Verplanck School trail is the same red-colored sandstone seen in roadcuts and stream beds near the Buckland Mall and elsewhere in the Connecticut Valley. These rocks, now well cemented and tilted by tectonic forces were deposited 180 million years ago during the age of the dinosaurs. The unconsolidated silts, sands and gravel that conceal the bedrock are very much more recent. Indeed the land surface along the present Hop Brook is probably no more than a few thousand years old. Although the land on which the Verplanck School is built is somewhat older, perhaps as much as 14,000 years but, it is still very recent in geologic terms.



Geologic Map

Scale 1" = 2000'



Surficial Deposits

Five types of surficial deposits are found within a mile of Verplanck School.

Listed in order of their age with keys in brackets to the Surficial Geologic Map of the Manchester Quadrangle (Colton, 1965) these are:

- *Glacial Till* (Qt): A loose, but well compacted, poorly sorted mixture of clay, silt, sand and gravel sized grains lacking any stratification or other internal structure. The till is deposited at the base of the last continental ice sheet to cover the area 30,000-15~000 years ago. Rocks and preglacial soils were dragged along by the flowing ice to form a layer 10 - 100 feet thick of finely ground debris molded and plastered onto the underlying bedrock. The streamlined hills, Sunset Ridge and Laurel Park Hill, a mile to the west of the School are formed of till and are textbook examples of glacial "drumlins."
- *Glaciofluvial deposits* (Qcd): Stratified well-sorted sands and gravels deposited by glacial meltwaters flowing on the surface and along the edges of the melting ice. The hummocky level terrain on which most of City of Manchester is built is underlain by material of this type.
- *Lake Deposits* (Ql): Laminated to varved clayey silt and sand deposited at the bottom of a large temporary lake which filled the Connecticut River Valley as the ice sheet receded northward. A thick accumulation of Glaciofluvial deposits near present day Rocky Hill dammed the lake until it was finally breached by stream erosion 10,000 years ago. Several tens of feet of silty lake deposits are present beneath the Verplanck trail area.
- *Deltaic deposits* (Qd): Well sorted and stratified silts, sands and gravels deposited in the delta at the mouth of the post glacial Hockanum River which built out into the temporary glacial lake. 30 to 40 feet of these delta sediments must once have covered Verplanck School Nature Preserve.
- *River Terrace Deposits* (Qst): Stratified sands and gravels. Once the Rocky Hill dam was breached, the large glacial lake drained and the Connecticut, Hockanum and Hop rivers sought new courses across the now high and dry deltaic and lake bottom sediments. Earlier sediments were eroded and redeposited to form a sequence of terraces at progressively lower elevations as the rivers established their new channels. The Hockanum River, although blocked by a group of glacial drumlins from following its pre-glacial SSW route to the Connecticut River found a low point near Laurel Park Hill and eroded a new valley for itself. The Hop river has

managed to keep pace with the Hockanum and has only recently (a few thousand years) assumed its present course.

- *Alluvium*: Recently deposited silts and sands. 10 to 20 feet of such material forms the present flood plain of the Hop River.
-

Natural and Manmade Modification of the Verplanck Nature Preserve Area

Alluvium now covers the entire Verplanck Nature Preserve. In the irregular hummocky topography subtle swales and channels can be discerned. These features are probably formed and obliterated every few hundred years when the Hop River floods its entire floodplain. Man however has substantially modified the natural topography in many places. There have been attempts (all destined to be unsuccessful on the river's 100+ year time scale) to dam the river, straighten its channel, run roads and drainage ditches across the floodplain and even major clearing grading and for agricultural and industrial purposes. The area is anything but pristine; our attempts to control the river and its floodplain are evident everywhere. With all this disturbance over the last hundred years, the river is now well out of equilibrium. However it is clearly attempting to reestablish control. Rivers seek a balance between erosion and deposition. They make no effort to be stable in the human sense. To them constant change represents stability. They will erode one bank while at the same time build a new sandbar some distance downstream. They curve and meander to help maintain this balance in spite of tremendous fluctuations in the amount of water and sediment they are forced to carry. Another "trick" well used by the Hop River is to set up "pools and riffles": a series of deep pools separated by shallow riffles (small rapids). This feature acts like a shock absorber to help regulate stream erosion and deposition during floods. Making a stream straight and uniform is a recipe for disaster. During the several thousand years history of the present Hop River its channel has probably migrated back and forth over its present flood plain scores of times, constantly destroying but always replacing a broad spectrum of wildlife habitats.

Educational Opportunities

The proximity of the trail and the school to the Hop River offers a unique opportunity to expose students to the interrelationship of ecology and hydrology. The river will cause change. Erosion and deposition accompany every flood. Some banks may collapse, perhaps destroying a favorite tree or nesting site, but at the same time new sites for vegetation will be created. If students could document such changes with photos and video over a period of several years (remember stream processes work on a time scale of several tens to hundred years) they may well develop a true appreciation for the value of change in natural processes.

The outdoor classroom also offers a valuable opportunity for students to see first hand the power of running water. Every year there is at least one flood that approached a bank-full stage. It is at that time a river accomplishes most of its work. Perhaps students, could take photos of some section of the river both before and after such an event. With this information they could answer such questions as: What size sediment moved? (paint or number a few rocks for easier identification). How fast was the water going at the peak of the flood? (a video timing floating debris between two known points can be rather accurate). Did the size and position of the sandbars change? Interesting map reading activities could be coupled with these activities. Where does the water passing the school come from (i.e. what is the drainage basin) and where does it go?

References

Colton, Roger B., 1965. Geologic Map of the Manchester Quadrangle, Hartford and Tolland Counties, Connecticut USGS GQ 433.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our information, there are 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 Natural Resources 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.

It is now possible for you to conduct an initial endangered species review using the "State and Federal Listed Species and Significant Natural Communities" maps available through your Town Hall. The Town Planner should have a copy of the map. This map shows the generalized locations for listed species and communities as gray-shaded areas on a 1:24,000 scale map of the town. An instruction sheet should be with the map to assist you in conducting an endangered species review.

Please contact the DEP-Natural Resources Center if you have further questions (424-3592). 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.

Fisheries Resources

Stream Habitat

The South Fork Hop Brook is a major tributary of the Hockanum River. It has a total watershed size of 11.8 square miles. Surface waters of the brook adjacent to the Verplanck School are classified by the Department of Environmental Protection (DEP) as "Class B/c." Designated uses for this classification are: fish and wildlife habitat, recreational use, agricultural and industrial supply, and other legitimate uses including navigation.

The stream environment consists of many types of habitat. Stream habitat next to the school is comprised of alternating pool and riffle habitat, intermixed with some runs. Habitat type, diversity, and overall amount often determines the productivity of a fish community. Descriptions of habitat types follow.

- *Pool:* A pool is that area of the stream that has slow water velocity and is usually deeper than a riffle or run. The water surface gradient of pools at low flow is close to zero. Pools are usually formed around bends or around large scale obstructions such as fallen trees that laterally constrict the channel or cause a sharp drop in the water surface profile. Pools are favorite resting areas for stream fish due to low water velocity.
- *Riffle:* Riffles are portions of the water column where water velocity is fast, stream depths are relatively shallow and the water surface gradient is relatively steep. Riffles are areas of high dissolved oxygen levels and often support abundant aquatic insect populations. Fish will expend high amounts of energy in riffles to maintain position.
- *Run:* A run is that area of water column that does not form distinguishable pools or riffles, but has a rapid nonturbulent flow. A run is usually too deep to be a riffle and too shallow to be a pool. The stream channel under a run is usually very uniform and flat.
- *Overhanging Vegetation:* Vegetation overhang indirectly provides fish food and cover and shades the water from solar radiation.
- *Undercut Bank:* An undercut bank is habitat created by erosion underneath a streambank. Undercut banks provide excellent cover for fish and are often considered a condition favorable to producing a high fish biomass.

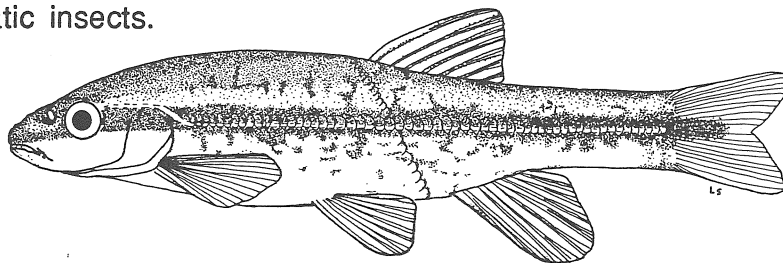
- *Large Woody Debris:* Trees that fall into streams, termed “large woody debris” serve a host of important functions such as create pool habitat, provide hiding places or cover for fish, help stabilize sediment transport and add to instream habitat complexity. Fallen trees should never be removed from a stream.
- *Tree Rootwads:* Rootwads are exposed root systems of trees that occur along a streambank and are often found near undercut banks. Rootwads are favorite hiding areas for stream fishes.

Fish Community

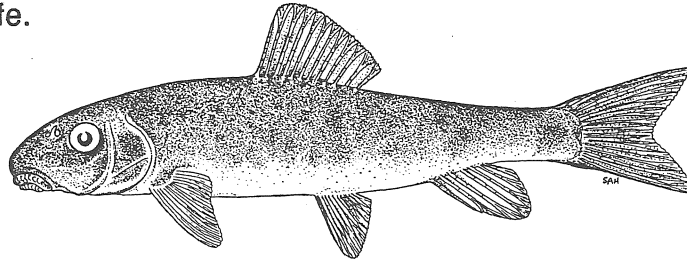
The CTDEP Fisheries Division last sampled Hop Brook on 8/29/89 within a 150 meter section near the Prospect Street Bridge crossing. The enclosed table lists some important physical, chemical and biological data that were collected. Based upon the sample, the most abundant fish species in Hop Brook were blacknose dace, white sucker, and pumpkinseed sunfish. Blacknose dace and white sucker were observed in the stream the day of the field review. Other less abundant fish species collected included: American eel, bluegill sunfish, golden shiner, and yellow perch. Within recent years, the Fisheries Division has received reports of brown trout being captured by anglers in Hop Brook near its confluence with the Hockanum River.

Life history descriptions of the abundant stream fish are provided below. To learn more about fishes that live in Connecticut waters, the following publication may be of interest: “Freshwater Fishes of Connecticut” by Walter R. Whitworth.

- Blacknose dace (*Rhinichthys atratulus*), a member of the minnow family, spawn in riffle areas during the spring (May-June). No nest is built. Eggs hatch in late spring. Sexual maturity is reached in one year. Males usually have reddish orange pelvic and pectoral fins and develop orange pigments on their sides during the spawning season. Dace do not usually get much larger than 3.5 inches. Similar to brook trout, dace mainly feed upon a variety of aquatic insects.



- White sucker (*Catostomus commersoni*) spawn in shallow riffles in the early spring (March April). There is no nest preparation or care of eggs or young. Adults often migrate downstream to deeper waters after spawning. Young usually remain in nursery areas or migrate to shallow habitat downstream. Sexual maturity is reached in 2-3 years and lengths in excess of 40 cm are attained. During the spawning season, males develop nuptial tubercles (hardened protuberance) on the lower parts of all fins and on the body scales. White sucker are bottom dwelling species that feed on a variety of plant and insect life.



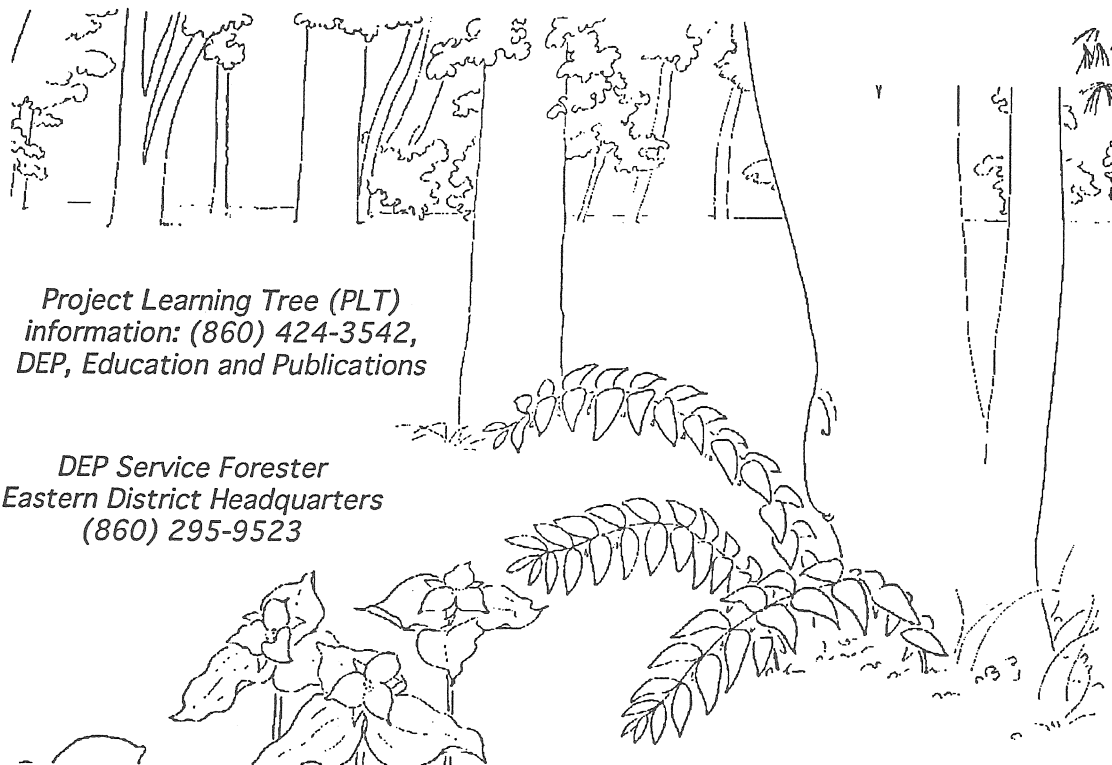
Recommendations

- A tentative location for the classroom observation deck was identified the day of the field review next to a moderately deep pool. This area of the brook also had several good microhabitat features such as overhanging vegetation and an undercut bank. It is recommended that the deck be constructed alongside the streambank and not be cantilevered over the stream.
- As an educational component, signage could be placed in the area of the observation deck showing a pictorial of some of the abundant stream fish such as white sucker and blacknose dace along with a brief narrative of their life histories.

Vegetative Resources

Education and Management

The 40+/- acre Verplank School Nature Preserve property is an excellent site for the interpretive nature trail and outdoor classroom which are present. This property has high vegetative diversity which is reflected by its high level of species richness. The nature trail which takes advantage of this diversity may be further developed and refined as time and funding permit. The development of stations along the trail which incorporate appropriate Project Learning Tree (PLT) material would be especially valuable for students learning about the forest environment. The sensitive nature of the wetland environments which are present pose special design problems which have been for the most part addressed in the design and construction of the existing trail system. The utilization of boardwalks, wood chips and crushed stone for the foot pathways have defined the trail and reduced the negative impact of continued use. Due to the fragile nature of this site and the vegetation which is present, large scale forest management is not appropriate. Limited light thinnings which focus on releasing selected trees to full sunlight could be implemented for demonstration purposes.



*Project Learning Tree (PLT)
information: (860) 424-3542,
DEP, Education and Publications*

*DEP Service Forester
Eastern District Headquarters
(860) 295-9523*

Vegetative Type Descriptions

The vegetation present on this tract of land falls into three broad categories. These include flood plain/wetland vegetation, upland vegetation and the vegetation present on the maintained right-of-way adjacent to the treatment plant. Except for the maintained right-of-way, these vegetation categories blend into one another and are very difficult to map. An extensive list of the vegetation found on this property has previously been compiled. Below is a brief description of each of the vegetation categories.

Flood Plain/Wetland

The majority of this property falls into the flood plain/wetland category. These wetland areas are somewhat variable with all size classes and age classes of trees represented. The vegetation under the transmission lines is maintained in a low condition. Each forested wetland area is unique, however they are characterized by the presence of red maple with any or all of the following tree species intermixed: eastern cottonwood, silver maple, box elder, sugar maple, Norway maple, basswood, sycamore, black willow, hawthorn, eastern hemlock, white pine, black gum, white ash, American elm, yellow birch, black birch and tuliptree. Swamp white oak, red oak and pin oak are also present but localized. A few of the larger trees in these wetland areas have cavities which make excellent den sites for many species of wildlife. The standing dead trees and the dead trees on the ground which are present are also valuable to wildlife. Understory vegetation includes pussy willow, spice bush, winterberry, buckthorn, hawthorne, shadbush, indigo bush, speckled alder, American hornbeam, eastern red cedar, highbush blueberry, red osier dogwood, swamp azalea, arrowwood, witch-hazel, winterberry, multi flora rose, swamp rose, staghorn sumac, smooth sumac, and barberry. Skunk cabbage, tussock sedge, clubmoss, horsetail, sphagnum moss, poison ivy, Virginia creeper, green briar, bittersweet, grape, groundnut, dodder, curlydock, burdock, stinging nettle, cinnamon fern, Christmas fern, sensitive fern, evergreen wood fern, steplebush, meadowsweet, wild geranium, marsh marigold, penny royal, Canada mayflower, rue anemone, wood anemone, Solomon's-seal, false Solomon's-seal, spotted wintergreen, trillium, violets, cinquefoil, dew berry, cleavers, Jack in-the pulpit, aster spp. and other wild flower species are present as ground cover.

Upland

This vegetation category is located on the slightly higher and better drained soils adjacent to the wetland soils. Trees in this category would respond well to the demonstration thinning proposed above. The trees which are present range in size from small seedlings to moderately sized sawtimber (11.1" in diameter at breast height (d.b.h.) and larger). The larger trees range between 60 and 100 years of age, are reasonably healthy and make good specimen trees. Black oak, scarlet oak, red oak, white oak, shagbark hickory, pignut hickory, mockernut hickory, butternut, American beech, white pine, eastern hemlock, black birch, yellow birch, tuliptree, black locust, sugar maple, white ash, red maple, quaking aspen, bigtooth aspen, black cherry, gray birch, eastern red cedar and flowering dogwood are the most common tree species present. Understory vegetation includes hardwood tree seedlings, maple leaved viburnum, spice bush, eastern hophornbeam, American hornbeam, mountain laurel, barberry, witch-hazel, highbush blueberry, lowbush blueberry and sheep laurel. Vine and ground cover vegetation includes poison ivy, Virginia creeper, green briar, bittersweet, raspberry, dewberry, Canada mayflower, Indian cucumber, false Solomon's-seal, wild sarsaparilla, club moss, evergreen wood fern, hayscented fern, bracken fern, cinnamon fern, Christmas fern, sensitive fern, ground nut, wood anemone and several species of clubmoss.

Right-of-way

The vegetation which is present on the maintained right-of-way adjacent to the treatment plant is dominated by grasses, sedges, wild flowers and weed species along with shrub and tree seedlings. Some wild flower and weed species which were observed include daisy fleabane, ox-eye daisy, black-eyed Susan, milkweed, Joe-Pye-weed, white clover, Queen Anne's lace, cleavers, goldenrod spp., ragweed spp., poison ivy, bittersweet, wild strawberry and raspberry. The shrub and tree seedlings which have become established include staghorn sumac, bayberry, buckthorn, gray birch, flowering dogwood, eastern red cedar, crab apple, choke cherry, quaking aspen, red maple and tuliptree. Periodic mowing keeps the shrub and tree species from completely taking over.

Hazards

Potential hazards on this property relating to the vegetation include poison ivy, stinging nettle and trees that have a high risk of injuring people that are utilizing the property. The poison ivy and stinging nettle which is located along the trails should be eradicated or well labeled so that it can be avoided. Trees with a major portion of their roots exposed, dead trees, dead tree parts and those trees which have a high probability of falling due to excessive decay or lean would be considered hazardous, especially if located near areas of high use such as the interpretive nature trail or the outdoor classroom. These high risk trees should be located, evaluated and perhaps removed.

The hemlock which are present on this parcel are infested with the Hemlock Woolly Adelgid. The Hemlock Woolly Adelgid is a small aphid-like insect that feeds on young Eastern Hemlock twigs during all seasons of the year with the greatest damage occurring during the spring. The loss of new shoots and needles seriously impairs the hemlock's health and vigor. Defoliation and tree death can occur within several years. The Adelgid is dispersed by wind, birds and mammals and is almost impossible to control in a forested environment. Dead hemlock trees that do not pose a direct threat to property users may be left standing to provide foraging habitat for birds.

More In-depth Information Available

Forests are dynamic, living systems that are ever changing through time. Planning, development and maintenance of the interpretive nature trail, outdoor classroom and demonstration stations will be an on going project. In-depth information regarding Project Learning Tree is available from the Department of Environmental Protection's Division of Education and Publications. Foresters are available from the Connecticut D.E.P. Division of Forestry to assist with this project on a more in-depth technical level. A listing of Certified Consulting Foresters that charge a fee for services not provided by the D.E.P. Foresters is available from the Division of Forestry.

**This information was provided by the Hockanum River Linear Park
Committee.**

MAY 1995

TREES ALONG VERPLANCK TRAIL TO HOCKANUM TRAIL

WHITE ASH	FRAXINUS AMERICANA
QUAKING ASPEN	POPULUS TREMULOIDES
AMERICAN BEECH	FAGUS GRANDIFOLIA
BLACK BIRCH	BETULA LENTA
GRAY BIRCH	BETULA POPULIFOLIA
WHITE BIRCH	BETULA PAPYRIFERA
YELLOW BIRCH	BETULA LUTEA
RED CEDAR	JUNIPERUS VIRGINIANA
BLACK CHERRY	PRUNUS SEROTINA
PIN CHERRY	PRUNUS PENNSYLVANICA
COTTONWOOD	POPULUS DELTOIDES
FLOWERING DOGWOOD	CORNUS FLORIDA
AMERICAN ELM	ULMUS AMERICANA
HAWTHORNE	CRATAEGUS (MANY SPECIES)
EASTERN HEMLOCK	TSUGA CANADENSIS
BITTERNUT HICKORY	CARYA CORDIFORMIS
SHAGBARK HICKORY	CARYA OVATA
BLACK LOCUST	ROBINIA PSEUDOACACIA
RED MAPLE	ACER RUBRAM
BLACK OAK	QUERCUS VELUTINA
PIN OAK	QUERCUS PALUSTRIS
RED OAK	QUERCUS BOREALIS
SCARLET OAK	QUERCUS COCCINEA
WHITE OAK	QUERCUS ALBA
EASTERN WHITE PINE	PINUS STROBUS
PITCH PINE	PINUS RIGIDA
SHADBUSH	AMELANCHIER CANADENSIS
STAGHORN SUMAC	RHUS TYPHINA
TULIP TREE	LIRIODENDRON TULIPIFERA
BLACK TUPELO	NYSSA SYLVATICA
PUSSY WILLOW	SALIX ALBA

MAY 1995

WILDFLOWERS, SHRUBS AND TREES FOUND ALONG VERPLANCK TRAIL TO HOCKANUM

WOOD ANEMONE	6 INCHES HIGH	WHITE FLOWERS
PARTRIDGEBERRY	3"	WHITE FLOWERS, RED BERRIES
DWARF GINSENG	6"	WHITE FLOWERS
POISON IVY	VINE TO 30 FEET	WHITE FLOWERS, WHITE BERRIES
MARSH MARIGOLD	1 FOOT	YELLOW FLOWERS NEXT TO WATER
TROUT LILY	6"	YELLOW FLOWERS
DANDELION	6"	YELLOW FLOWERS
SKUNK CABBAGE	1 TO 2 FEET	BIG GREEN LEAVES IN WETLANDS
PRINCE'S PINE	6 "	EVERGREEN GROUND COVER
SPOTTED WINTERGREEN	3 TO 6"	WHITE FLOWERS, BROWN SEEDS
JACK-IN-THE-PULPIT	1 TO 2 FEET	GREEN FLOWERS, RED BERRIES
CINNAMON FERN	2 TO 3 FEET	
MOUNTAIN LAUREL	2 TO 8 FEET	PINK-WHITE FLOWERS
HIGHBUSH BLUEBERRY	2 TO 8 FEET	WHITE FLOWERS, BLUE BERRIES
SPICEBUSH	6 TO 12 FEET	YELLOW FLOWERS
CLIMBING BITTERSWEET	VINE TO 30 FEET	GREEN FLOWERS, YELLOW-ORANGE BERRIES
PHRAGMITES	GIANT REED 5 TO 15 FEET	
RHODORA RHODODENDRON	1 TO 3 FEET	LAVENDER FLOWERS
MULTIFLORA ROSE	6 TO 15 FEET	WHITE FLOWERS
PUSSY WILLOW	5 TO 10 FEET	WHITE TO YELLOW FLOWERS
WINTERBERRY	3 TO 10 FEET	WHITE FLOWERS, RED BERRIES
STAGHORN SUMAC	3 TO 30 FEET	GREEN FLOWERS, FUZZY STEMS, RED-BROWN BERRIES
RED CEDAR	SMALL TO MEDIUM TREE	EVERGREEN
BLACK CHERRY	MEDIUM TO LARGE TREE	WHITE FLOWERS, PURPLE FRUIT
WHITE BIRCH	MEDIUM TO LARGE TREE	
YELLOW BIRCH	MEDIUM TO LARGE TREE	
EASTERN HEMLOCK	LARGE TREE	EVERGREEN, TINY CONES 1½ INCHES
WHITE PINE	LARGE TREE	EVERGREEN, CONES TO 6 INCHES
SHAGBARK HICKORY	LARGE TREE	GREEN NUTS

MAY 1995

BLACK OAK	LARGE TREE, CHECKED BARK
RED OAK	LARGE TREE, FURROWED BARK
AMERICAN BEECH	LARGE TREE, SILVER BARK, LEAVES STAY ON ALL WINTER
WHITE ASH	LARGE TREE, WINGED SEEDS, 7 LEAFLETS PER LEAF
BLACK LOCUST	LARGE TREE, THORNY BRANCHES, 12 ROUND LEAFLETS PER LEAF
QUAKING ASPEN	LARGE TO MEDIUM TREE, LEAVES ALMOST ROUND
BLACK BIRCH	LARGE TO MEDIUM TREE, SMOOTH ALMOST BLACK BARK WITH RINGS
GRAY BIRCH	MEDIUM TO SMALL, WHITE BARK, BLACK BRANCHES
PIN CHERRY	SMALL TREE, REDDISH SMOOTH BARK
BITTERNUT HICKORY	LARGE TREE, 9 LEAFLETS PER LEAF, ROUND NUTS
BLACK TUPELO	LARGE TO MEDIUM, BRIGHT RED LEAVES IN FALL
COTTONWOOD	LARGE TREE, DEEPLY FURROWED BARK, FLUFFY COTTON SEEDS IN WIND
FLOWERING DOGWOOD	SMALL TREE, WHITE FLOWERS
AMERICAN ELM	LARGE TREE, GRACEFULLY CURVING BRANCHES
HAWTHORNE	SMALL TREE, MANY THORNS
RED MAPLE	LARGE TREE, LIKES WET AREAS, LEAVES HAVE THREE POINTS
PIN OAK	LARGE TREE, MANY SIDE BRANCHES, TINY ACORNS
SCARLET OAK	LARGE TREE, LEAVES HAVE POINTED LOBES
WHITE OAK	LARGE TREE, WHITISH BARK, LEAVES HAVE ROUNDED LOBES
PITCH PINE	LARGE TO MEDIUM TREE, 3 NEEDLES PER CLUSTER
SHADBUSH	SMALL TREE OR BUSH, WHITE FLOWERS, PURPLE BERRIES
TULIP TREE	LARGE TREE, TULIP SHAPED LEAVES

5/96

Verplanck Trail Plant Life

Prince's Pine	a form of giant moss creating a ground cover and sometimes used at Christmastime to make decorative roping.
Bayberry	a fragrant shrub mostly associated with the seashore but found growing inland - used to make bayberry candles from its grey waxy berries.
Sweetfern	another fragrant shrub - not a true fern - which usually grows in waste places and sterile soil such as railroad embankments.
Partridgeberry	a ground cover with tiny evergreen leaves and red berries.
Checkerberry	a ground hugging evergreen with red berries and spicy tasting leaves.
Skunk Cabbage	a large leaved, rank smelling plant which grows in wet areas and sometimes will appear through the snow in January or February.
Marsh Marigold	large yellow flowers appearing in marshy areas in the Spring.
Poison Ivy	Beware "Leaves of three, leave it be". It is very important that children come to recognize this plant in its every form. It may be a shrub or a vine, climbing trees as a large hairy vine, but the unmistakable "leaves of three" never varies.

Trees and Shrubs

Black Oak	Pitch Pine	Black Birch
Red Oak	Mulberry	Canada Hemlock
Scarlet Maple	Black Locust	White Birch
White Pine	Witch Hazel	Yellow Birch
Spice Bush	Sycamore	Winterberry
Alder	Sheep Laurel	Bayberry

Some of these trees have been labeled and more labels are planned for the future.

STONE DUST PATH

The stone dust path, at which the Verplanck trail terminates has a somewhat different selection of plants due to its more open and marshy situation. These plants would include viburnums, arrow wood, (a type of viburnum) grapevine, purple loosestrife, jewelweed, nettles, and that bane of trail workers - bittersweet.

On this path there is a spectacular white ash tree which was blown down at some point in the past. From the prostrate tree, still anchored in the ground, a whole new thicket of ash trees has sprouted.

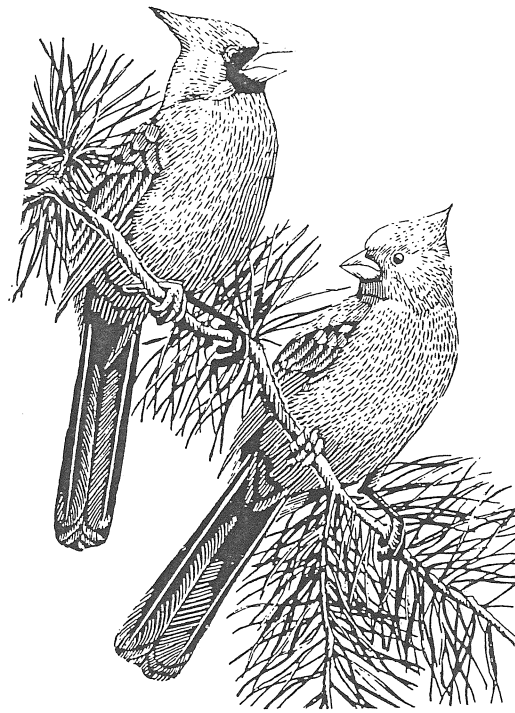
Wildlife Resources

Current Conditions

The Verplanck School nature trail meanders through a variety of conditions and habitat types. There are predictably varying communities of wildlife utilizing the habitats from the Hockanum river and its floodplains and wetlands to the upland forests. The trail offers many opportunities for nature education and passive recreation.

Field Observations and Notes

The following wildlife were observed during the field visits either directly or indirectly by identifying calls, tracks, scat or other sign: whitetail deer, red fox, beaver, river otter, eastern chipmunk, meadow vole, short-tailed shrew, American robin, gray catbird, northern cardinal, mourning dove, American crow, common grackle, downy woodpecker, red-eyed vireo and yellow warbler.



Habitat Conditions

The trail-side vegetation is diverse and includes native and non-native plants. Invasion of non-native invasive plants is a problem in some sections of the trail. Notable invasive non-native plants found along the trail are Japanese honeysuckle vine (*Lonicera morrowii*), multiflora rose (*Rosa multiflora*), Autumn olive (*Elaeagnus umbellata*), tartarian honeysuckle (*Lonicera tatarica*), and Asiatic bittersweet (*Celastrus orbiculatus*).

The plants list (ERT packet materials) for the trail that was included as background information is excellent and shows the diversity of plants found in the habitats along the trail. In addition to this list, the following plants were also noted: common elderberry (*Sambucus canadensis*), low bush blueberry (*Vaccinium angustifolium*), indigo bush (*Amorpha spp.*), Carolina buckthorn (*Rhamnus caroliniana*), bayberry (*Myrica pensylvanica*), bigtooth aspen (*Populus grandidentata*), silver maple (*Acer saccharinum*), boxelder (*Acer negundo*), arrowwood viburnum (*Viburnum recognitum*), mapleleaf viburnum (*Viburnum acerifolium*), alternate-leaved dogwood (*Cornus alternifolia*) and ironwood (*Carpinus caroliniana*).



Ironwood

Habitat Management and Planning Considerations

The trail and adjacent property needs to have a long term habitat management plan which encompasses the increase and maintenance of biodiversity. Also, in concert, with the habitat management, a plan is needed for utilizing the property for recreation. As properties are developed, natural areas are divided into smaller, isolated pieces. Land that is in public ownership can be managed for wildlife habitat for the long term. In contrast, private land, which consists of 88 percent of the land in Connecticut, usually changes ownership and is not managed for wildlife for the long term. This publically-owned property can be a place where habitat is improved and managed for wildlife for the enjoyment and nature education for area citizens.

The powerline area has a diversity of fruiting shrubs, however many invasive non-natives are also prevalent. The early successional habitat of the powerline provides variety to the trail, but controlling the invasive plants will be a challenge (communication with powerline managers [NU?] can help by asking them to herbicide the invasive species during their normal vegetation management activities).

Controlling invasive non-native plants will require a diligent application of mechanical removal by hand, pick and shovel, and tractor (back-hoe). Also, application of herbicides may be necessary for some invasives to prevent resprouting of cut stumps (if herbicide use is a major concern - least environmentally sensitive compounds can be used). The need for controlling invasive non-natives outweighs the risks of utilizing herbicides.

Managing invasive non-natives along the trail and on adjacent open space land should be planned and strategies should be implemented to reduce their impacts to the natural habitats. Limited herbicide use should not be ruled out as an option to control some of the particularly aggressive invasive plants. It is advised to consult with the Connecticut Agricultural Experiment Station (Todd Mervosh) at 860-683-4984 for advice on herbicides.

I. Other Habitat Enhancements

Plantings for improving seasonal food sources and cover can be accomplished along the trail and especially on Verplanck School grounds. At the trail head, the school's nature area can be planted with a variety of fruiting shrubs and wildflowers. Further technical assistance is available from the team biologist. All plantings **should not** be invasive non natives. The following plants **should not** be planted:

Trees

- Norway Maple (*Acer platanoides*)
- Tree of Heaven (*Ailanthus altissima*)
- Catalpa (*Catalpa spp.*)

Shrubs

- Autumn Olive (*Elaeagnus umbellata*)
- Russian Olive (*Elaeagnus angustifolia*)
- Winged Euonymus (*Euonymus alatus*)
- Burning bush (*Euonymus atropurpureus*)
- Privet (*Ligustrum spp.*)
- Tartarian honeysuckle (*Lonicera tatarica*)
- Common buckthorn (*Rhamnus cathartica*)
- Glossy buckthorn (*Rhamnusfrangula*)
- Multiflora rose (*Rosa multiflora*)

Vines

- Asiatic bittersweet (*Celastrus orbiculatus*)
- Japanese honeysuckle (*Lonicera japonica*)

II. Other Habitat Enhancements

Plantings should strive to be complimentary to the existing habitat and species which occur in the particular habitat area should be utilized. Careful observation of plant communities and plant succession of a particular area will help formulate species lists for enhancement or restoration.

Plant materials should be of native sources as much as possible. Plant species which restore and enhance natural habitat conditions should be utilized and invasive non native species avoided. Plantings of native trees, shrubs and wildflowers can enhance conditions for wildlife in the area. Planting should strive to diversify the seasonal availability of food sources such as planting spring, summer, fall, or winter persistent food sources. Enhancement of seasonal food sources benefits resident wildlife as well as migratory species which may come through in spring and fall periods. The following is a select list of native plants which can be used to enhance the property (species currently found on the property):

Native trees

- Flowering dogwood (*Cornus florida*)
- Black Cherry (*Prunus serotina*)
- Pin Cherry (*Prunus pensylvanica*)
- White pine (*Pinus strobus*)
- Eastern Red Cedar (*Juniperus virginiana*)

Native shrubs:

- Gray dogwood (*Cornus racemosa*)
- Silky dogwood (*Cornus amomum*)
- Arrowwood viburnum (*Viburnum recognitum*)
- Nannyberry viburnum (*Viburnum lentago*)
- Common Elderberry (*Sambucus canadensis*)
- Winterberry (*Ilex verticillata*)

Additional native plants (not currently found on property):

- American Holly (*Ilex opaca*)
- Bayberry (*Myrica pensylvanica*)
- American Cranberry Bush (*Viburnum trilobum*)
- Sweet pepperbush (*Clethra alnifolia*)
- Hackberry (*Celtis occidentalis*)

III. Other Habitat Enhancements

Meadow Environment Plantings

Encourage native wildflowers through selective mowing. Maintain herbaceous environment by mowing fields at least once a year to prevent woody plant invasion. Plant/seed native wildflowers throughout the open meadow areas.

IV. Other Habitat Enhancements

Native Plant Sources

New England Wildflower Society, Inc. Garden in the Woods, Hemenway Road,
Framingham, MA 01701-2699 Tel.617-237-4924Or877-7630

Connecticut Native Trees Availability List. 16 pp. Peter M. Picone
DEP Wildlife Division, P.O. Box 1550 Burlington, CT 06013
Tel. 860-675-8130

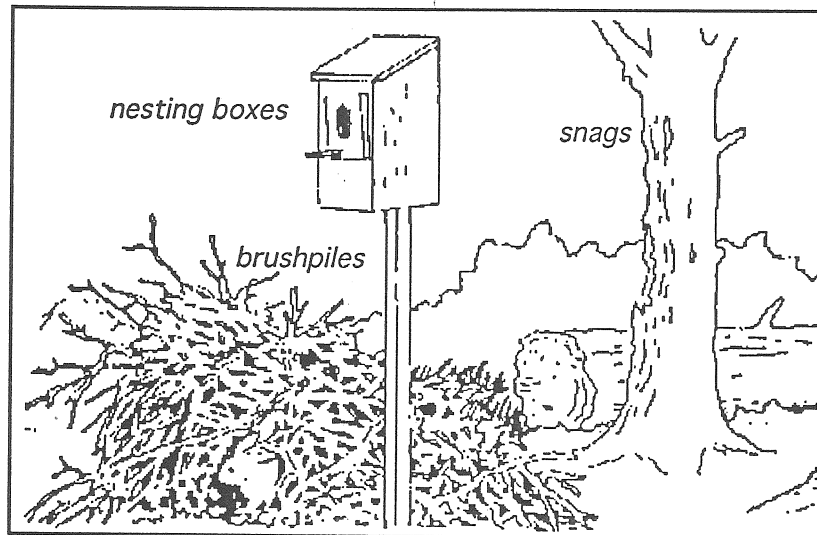
DEP Forestry Division, Seedling Program, Pachaug State Nursery,
Box 23A,190 Sheldon Road, Voluntown, CT 06384 Tel. 860-376-2513

Connecticut Native Shrubs Availability List.12 pp. Peter M. Picone
DEP Wildlife Division, P.O. Box 1550, Burlington, CT 06013
Tel. 860-675-8130

V. Other Habitat Enhancements

Dead or dying wood is part of habitat for wildlife, especially woodpeckers and a whole host of secondary users such as screech owls (*Otus asio*), bluebirds (*Sialia sialis*) and flying squirrels. Snags can be created by cutting two complete bands through the bark with a chainsaw or ax (type of trees and technique information is available from Team DEP forester or wildlife biologist). A minimum of 3-5 snags (dead or dying trees) per acre should be present or created per acre of forested area.

Nestboxes which mimic cavities in dead wood can be erected along the trail. Nestboxes for gray squirrels, screech owls, bluebirds, black-capped chickadees, house wrens, wood ducks, can be placed in appropriate habitats and serve as demonstrations for trail users. The team biologist is available for consultation on placement of nestboxes. Also, building plans are available upon request.



Nature Trail Development and Planning

Wildlife habitat is made up of all the existing and managed components of the property. It is the collective summation all the environmental factors which provides food, water, cover and their spatial arrangement. The property can be utilized to teach residents how to recognize the various habitat components and also have some "take home" messages or ideas on how to manage their own properties; big or small. Nature trails, however, should not be allowed to criss-cross the entire property. Trails should allow some parts of the property to remain as refugia where wildlife remain undisturbed by large volumes of foot traffic. Pets should not be allowed on the property especially during the nesting seasons. A strict leash law should be in place and enforced.

The trail system can serve to point out the varying habitat types and other points of interest on the property. The various habitat components such as:

- Spring foods
- Summer foods
- Fall berries
- Winter persistent berries
- Conifers and evergreens
- Nut sources

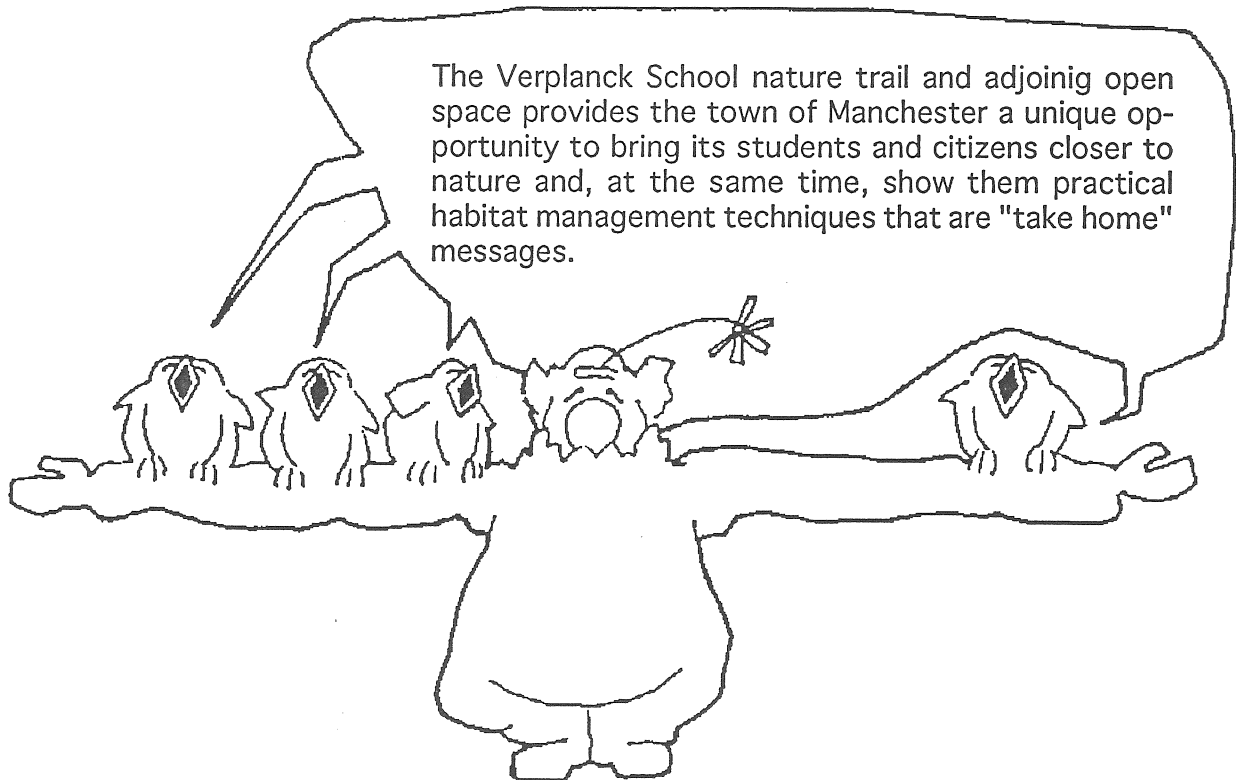
- Herbaceous plants and wildflowers
- Nectar plants
- Dead or dying trees
- Artificial nest boxes
- Man-made brushpiles / rock piles
- Water sources

Each habitat component contributes, in some way, to the ecology of the property. The various components can be identified by trail markers or signs. Also, a trail guide can be developed which corresponds to numbers along the trail. This can reduce the maintenance of signage and requires trail users to pick up a guide from a centralized trail head, school property or town hall.

Practical Wildlife Censusing Techniques

Counting or documenting the presence or absence of wildlife along the trail can be both fun and educational for the trail users. It also teaches the importance of record keeping and identification of wildlife (directly or indirectly)

- Locate nests and other wildlife occurrences
 - seasonally locate nests and plot locations on maps
 - find den trees and natural cavities in trees and find out what animal is using it.
- Owl hooting Survey
 - play and owl hooting tape and listen for response
- Bird Count
 - document their seasonal presence
- Snow tracking
 - following a light snowfall (2-3 inches), animal tracks can be identified and followed to see where they are travelling to and from. Also, they may detect what the animal is doing or eating.



This report provides only a handful of ideas for the property. For more information and further technical help please contact the Team wildlife biologist at DEP Wildlife Division, Sessions Woods Wildlife Management Area, Route 69, Burlington, CT 06013, Tel. (860) 675-8130.

Archaeological Resources

Cultural Resources

A review of the State of Connecticut Archaeological Site Files and Maps shows one Contact native American site located on the knoll where the Verplanck School currently resides. In addition, two archaeological sites, one pre-contact native American and one historic of Euroamerican origin, are located on the east side of Love Lane, and, one Indian site is located to the south along South Fork Brook. Verplanck School appears to be located at the village site for the Podunk Indian tribe. The village is described in Spiess and Bidwell's *History of Manchester, Connecticut*, 1924. The site's integrity has been destroyed due to school construction activities. The 19th-century historic archaeological site exists in the remnants of an old farmstead, including a buried house foundation, 3 wells and a buried system of irrigation pipes. The old existing sandstone dam across the brook appears to be ruins of a farm pond feature. The dam is not historically significant, however, it does tell the story of landuse during Manchester's agrarian past.

The project area consists of low lying marsh and floodplain which historically would not have to been used as a settlement site. However, the adjacent terraces of Love Lane and the Verplanck School property provide the well-drained, elevated soils and topography adjacent to the wetlands that provide ideal occupation settings. Hence, the archaeological resources mentioned above. The proposed trails will have no impact on any significant cultural resources.



Educational Opportunities

The project does have the potential of teaching the history of Manchester in a unique way. Students can be brought through the trail system, including the school yard, and learn of native American lifeways and adaptation to the natural resources encountered during their hike. How did the Indians use the woodland environment in terms of their technology? Why did they develop a village site where the school is now located? Teaching aspects of the culture of Podunk Indians can provide a sense of time and space. The fact that the land they learn and play on was a former Indian village site can be a powerful learning tool. Test excavations in the school yard might still reveal artifacts and features associated with the village. Students can learn about the science of archaeology as well as native lifeways. Historic farming history can also be taught in a similar fashion. How would the land look different 100 years ago than it does today? How has farming and historic landuse changed the pattern and flow of the pond and brook system? Educational opportunities are vast, not simply in terms of natural resources, but in terms of cultural resources.

The Office of State Archaeology serves as public education coordinator in Connecticut for the Society for American Archaeology. In that capacity, the Office of State Archaeology maintains comprehensive files on teaching opportunities for grade school students. They have accumulated class activities, curriculums, and presentations that may be useful to Verplanck School in using the nature preserve and its trail for educational experiences. These resources are available through the Connecticut State Museum of Natural History and the Office of State Archaeology, University of Connecticut, Storrs (Tel: 860-486-5248).

Environmental Education

The Team member who is the environmental education curriculum coordinator for DEP offers the services of the program he coordinates, Project WET (Water Education for Teachers), for water education activities (at the Verplanck site and/or within the Manchester school system) for educators and students grades K-12. It is felt that the Verplanck site itself is already an excellent resource for field education, with its in-development amphitheater area, its streamside water monitoring access, diverse vegetative cover, etc. During the brief visit the DEP Project WET Coordinator personally observed a red fox, yellow warbler, ovenbird, catbird, cardinal, cedar waxwing, etc. as well as numerous interesting plant species including bayberry, generally thought of as a coastal species -- so it is known that this site, with its associated wetland ecosystem and the landfill nearby -- is attractive to wildlife and other life forms worth studying.

However, he is hard-pressed to offer any truly novel ideas that haven't already been considered for this site or suggested by other Review Team members. The site itself and the expressed plans for it use seem strong already. However, what he can provide is an offer to work with school personnel and possibly the Hockanum River Watershed Association/Linear Park Committee to provide Project WET activities and resources to both educators involved with the Preserve and their students.

Included with this report are some informational materials on Project WET. They will provide interested parties with an overview of the program. The two main components are: educator workshops, for which Project WET offers CEU credit and which are the only way the 500-page WET curriculum guide may be obtained (it cannot be purchased and is available only through attendance at this workshop); and school programs for students, which are offered on a limited basis each month. Project WET is supplementary and interdisciplinary, and very easy to integrate into existing curricula and lesson plans.

Teachers, educators and administrators from Verplanck School and the Manchester/Hockanum River Regional Drainage Basin area are encouraged to use the resources of Connecticut Project WET and National Project WET (through CT WET) as an adjunct to their activities relating to the Verplanck School Nature Preserve. Dave Parsons, the DEP-CT Project WET Coordinator can be reached at (860) 424-3538, his E-mail address is dave.parsons@po.state.ct.us.

ABOUT THE TEAM

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 203-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.