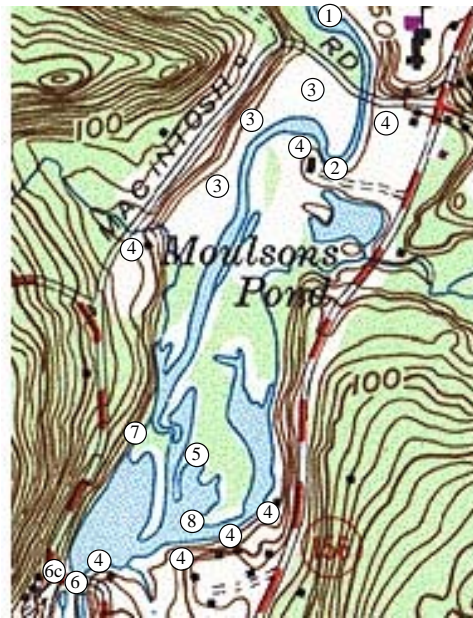




Connecticut River Watch Program

EIGHTMILE RIVER STREAM WALK SUMMARY REPORT



Key for sites of interest:

- | | |
|------------------------------|---------------------------------|
| ① Dredged "swimming hole" | ⑤ Floating islands |
| ② River bank lined with rock | ⑥ Dam, "c" = rock lined culvert |
| ③ Cornfield | ⑦ Hidden stream |
| ④ Lawn | ⑧ Wood duck box |

Funded in part by the CT DEP through a US EPA Clean Water Act §319 nonpoint source grant



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Eightmile River Stream Walk Summary Report
Jane Brawerman, Connecticut River Watch Program Director

Middlesex County Soil and Water Conservation District
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860/346-3282

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INTRODUCTION

During the summer and fall of 1999 the Connecticut River Watch Program (CRWP), in cooperation with the Eightmile River Watershed Committee and the University of Connecticut Cooperative Extension System (CES), conducted a Stream Walk Survey of the Eightmile River. Teams of volunteers, for the most part Eightmile River riparian landowners, walked segments of the Eightmile River to collect visual information about its physical condition. The survey project was the first step in what we hope will become a long-term community-based monitoring and assessment program, designed to help insure the protection of this valuable resource. Survey goals included: to establish a baseline of physical conditions; to identify areas of the river in need of protection or restoration; and to raise community awareness of the River and the need to protect it. Information collected will be used to plan and prioritize conservation and improvement efforts. The CRWP monitoring program is intended to complement and enhance existing education and conservation efforts being conducted as part of the CES Eightmile River Watershed Project. Begun in 1995, the watershed project has been assisting the Eightmile watershed communities in protecting their natural resources as they develop their towns.

BACKGROUND

The Eightmile River Watershed

The Eightmile River is a major tributary of the Connecticut River located in the Tidelands Region of the lower Connecticut. The Eightmile flows approximately 15 miles from its headwaters in East Haddam to its confluence with the Connecticut River in Lyme. Its watershed comprises a 62 square mile area draining large portions of East Haddam, Lyme and Salem, and smaller portions of Colchester and East Lyme. Before it meets the Connecticut River, the Eightmile opens up into Hamburg Cove. This largely undeveloped watershed is home to a number of rare and endangered plants and animals. A recent water quality assessment of the Eightmile River and its main tributary, the East Branch, undertaken by the Department of Environmental Protection (DEP), has documented good water quality and a healthy benthic macroinvertebrate community. The Eightmile River watershed is included in Connecticut's Unified Watershed Assessment as a category 2 (protection) watershed, and was recommended for monitoring/assessment by the DEP ambient monitoring group.

The Eightmile River Watershed Project

The Eightmile River Watershed Project, a joint effort of the University of Connecticut Cooperative Extension Program and The Nature Conservancy, was begun in 1995. The purpose of the project is to assist the Eightmile watershed communities in protecting their natural resources as they develop their towns. The project has focused on educating municipal officials and landowners in the watershed about its natural and cultural resources through use of geographic information system (GIS) technology, and promoting use of this information to guide land use decision-makers and watershed property owners. An advisory committee, made up of representatives of the three major watershed towns (East Haddam, Lyme and Salem) and other interests (e.g. the local land trusts), provides local input. Financial and other support for the project has come from the Environmental Protection Agency, and the U.S. Fish and Wildlife Service Silvio Conte Fish and Wildlife Refuge.¹

The Connecticut River Watch Program

The Connecticut River Watch Program (CRWP) is a volunteer water quality monitoring, protection and improvement program for the Connecticut River and its tributaries. CRWP is sponsored by the Middlesex County Soil and Water Conservation District and was initiated in 1992 in cooperation with River Watch Network, a national organization based in Vermont.

¹ Eightmile River Watershed Project website – <http://www.canr.uconn.edu/ces/nemo/eightmile.html>

Over its first eight years CRWP focused its monitoring activities on the lower Connecticut River main stem and two tributary watersheds, the Mattabesset and the Coginchaug. The program has generated an extensive water quality database for these rivers, and raised local awareness of river resources and water quality issues through public involvement and outreach activities. Information collected through CRWP has been used by towns to investigate potential sources of pollution, and by the state for planning purposes. It has become a model program, with wide support from the local communities and state and federal environmental officials. Funding for CRWP has come primarily from the DEP through grants from the US EPA under Section 319 of the Clean Water Act.

In 1999, CRWP expanded into new watersheds within the Connecticut River basin. Now a regional support service, the program's focus is to initiate, support and coordinate community-based river monitoring, assessment and improvement programs in regional watersheds throughout the basin. Through the new program, CRWP continues to put water quality and physical survey information into the hands of local communities, and support efforts to use that information to direct river and other watershed protection and improvement efforts.

PROJECT SUMMARY

Survey Goals

The Eightmile River Stream Walk Survey was undertaken to initiate a long-term community-based volunteer monitoring program in the Eightmile River watershed. Based on input from the Eightmile River Watershed Committee, it was decided that the Eightmile River main stem would be the focus of this first year effort. The goals of the survey activity include:

- ◆ Develop a baseline of information about the physical characteristics of the Eightmile River
- ◆ Raise public interest in and knowledge of the Eightmile River and its watershed, both about the resources it has to offer to the community and the need to protect it
- ◆ Develop public awareness of water quality issues and human impacts on our rivers
- ◆ Build awareness among riparian landowners of the importance of maintaining streamside buffer areas
- ◆ Identify areas of concern and potential pollution problems that can be used to plan conservation and improvement efforts
- ◆ Form the basis for more complex water quality monitoring activities that can be pursued in the future according to needs, level of interest, ability to commit time, and the availability of other resources

Survey Design and Methodology

A Stream Walk survey is a survey of the physical characteristics of a river corridor. The survey is a systematic way to observe and record information about the river channel (water and stream bottom), the stream banks, and the adjacent land. Physical characteristics of streams are important to the aquatic life that a stream supports – physical changes can degrade stream habitat and make the stream inhabitable by naturally occurring plants and animals.

Stream surveys are designed to take place in late summer and early fall, when water flows are low and slower, making it both possible and safe for volunteers to walk through streams to record observations. At this time water temperatures also tend to be warmer and aquatic plant growth is at its most abundant. In addition, emergent plants are tall and trees and shrubs have their leaves, important for estimating the types of streamside vegetation.

Survey sheets were developed to collect visual information on the physical conditions of the Eightmile River and surrounding land, and to help identify possible areas of concern. The Eightmile survey form is adapted from the 1998 Mattabeset River Stream Walk Survey form.² Survey sheets include the main survey with questions about general stream corridor characteristics, including water depth and width, stream bank cover, width of riparian corridor, water color/clarity, aquatic vegetation, composition of substrate, adjacent land uses, potential sources of pollution, and recreational use. An additional sheet was used to further describe possible areas of concern (see Attachment A). Detailed instructions for completing the survey were also included on the survey sheet. Survey sheets were copied on waterproof paper for use in the field.

² The Mattabeset survey was adapted from those used for the Quinebaug and Norwalk River watershed stream surveys, developed by the Natural Resources Conservation Service (NRCS) and the New London and Windham County Soil & Water Conservation Districts.

The Eightmile River main stem was delineated into 9 segments for the Stream Walk Survey, primarily based on access (see Table 1, below).

Table 1. Eightmile River Watershed Stream Walk Segments

Town	Segment # and Location	Distance
East Haddam	1 Geoffrey Road to Unpaved Road	~ 5000 ft
East Haddam	2 Unpaved Road to Foxtown Road	~ 8000 ft
East Haddam	3 Foxtown Road to Jones Hill Road	~ 6000 ft
East Haddam	4 Jones Hill Road to Dolbia Hill Road	~ 6000 ft
East Haddam	5 Dolbia Hill Rd. to Norwich Salem Rd.	~ 4000 ft
East Haddam/ Lyme	6 Norwich Salem Rd. to Hamburg Rd.	~ 4000 ft
Lyme	7 Hamburg Road to Macintosh Road	~ 8000 ft
Lyme	8 Macintosh Road to Mt. Archer Rd.	~ 4000 ft
Lyme	9 Mt. Archer Road to Joshuatown Rd.	~ 4500 ft

Volunteer Recruitment/Landowner Permission

A mailing was sent to all Eightmile River riparian landowners to request their assistance with the survey project. Riparian landowners were identified with assistance from East Haddam and Lyme town staff, and a landowner database was developed. Volunteers were requested to either perform the surveys themselves or give permission for others to perform the survey on their property. A stamped, self-addressed response postcard was sent with the letter, along with a flyer describing the survey project and announcing the volunteer training session. Response to the landowner mailing was overwhelmingly positive, with all but two of thirty-three respondents indicating their interest in participating or providing permission for others to walk their properties. The mailing was sent to sixty landowners of record. Several were returned “undeliverable as addressed” or with a similar notation.

Additional volunteers were solicited through the East Haddam and Lyme Land Trusts, and the town conservation and inland wetland commissions.

Geographic Information System Mapping

To aid in planning and implementing the Eightmile River Stream Walk, riparian landowner information was merged with an existing geographic information system (GIS) based database for the Eightmile watershed.³ Joining the landowner database with the ArcView system allowed the development of a map showing property boundaries and landowner names. A system of color-coding was used to indicate landowner response to our request for assistance. The final map was used to delineate segments and group volunteers to complete segment surveys.

³ The original GIS database was developed by UConn Cooperative Extension System Nonpoint Education for Municipal Official (NEMO) program staff. All GIS work for this project was done by Joel Stocker, the NEMO program’s GIS Coordinator.

In addition to an overall map showing the river corridor, segment maps (8 ½ x 11") were produced using the GIS to be used for reference in the field, and to record the approximate location of photographs and areas of concern. The segment maps included topographic maps, so the surveyor would be able to calculate slope (a requirement of the survey form), as well as an orthophoto map to determine canopy cover.

Volunteer Training and Participation

Prior to conducting their surveys, volunteers were trained in assessment procedures. 27 people attended the Stream Walk training, held on August 21, 1999 at the Lyme Town Hall. Training included both indoor and field components, and was modeled after the training format developed for the 1999 Shetucket River stream survey. Conservation District staff conducted the training, with assistance from UConn Cooperative Extension System (CES) staff.

The training agenda included: an introduction to the Eightmile River Watershed Project presented by CES staff; an introductory video on Stream Walks⁴; a presentation on use of topographic and orthophoto maps; and a review of survey questions and slide presentation illustrating stream characteristics and areas of concern. Etiquette and safety issues were also reviewed, as were the contents of volunteer packets (see below). Volunteers were offered the opportunity to sign up as Earth Team Volunteers, a program sponsored by the USDA Natural Resources Conservation Service (NRCS), to receive coverage for tort claims and injuries incurred during volunteer activities.

The training included a guided stream walk. Volunteers walked a stretch of a stream segment and instructors demonstrated assessment procedures, including substrate classification, describing river profile, estimating stream width and depth, and identifying vegetation and aquatic organisms. Preparation tips were given to participants and questions addressed.

Volunteers signed up for specific river segments and received materials and supplies. Volunteers were given a Stream Walk Training Manual, providing both instructions and background information on physical characteristics used to describe streams, and physical conditions indicative of water quality problems or stream habitat degradation. The training manual was adapted from the manual developed by NRCS and the Conservation Districts for the Quinebaug and Shetucket River surveys. In addition to the survey sheets and training manual, volunteers received a packet of materials that included safety information, fact sheets about the Stream Walk Survey project and the Connecticut River Watch Program to give to interested residents, and color topographic and orthophoto maps of the area of the stream segment to be walked. They were also provided film and asked to take pictures of areas identified as potential areas of concern, as well as areas representative of the character of the stream.

Training staff recommended that volunteers walk their stream segments upstream to downstream. If possible, they were advised to walk their entire segment prior to recording any observations on survey sheets. This would allow them to define the different stream sections, or reaches, in their segment; a separate survey form was to be filled out every time there was an abrupt change in the physical characteristics of the stream, including slope, width, depth, substrate materials, streamside vegetation, channel pattern, etc.). The minimum length for a stream reach was defined as 1000 feet.

Actual Stream Walks took place in September and October, according to individual schedules. Property owners worked in teams to complete their surveys. In areas where we had not received responses from property owners, volunteers agreed to request permission from their neighbors to conduct the survey. 29 people participated in the Stream Walks.

⁴ This training video was produced for the Quinebaug-Shetucket Stream Walk Survey project by the New London and Windham Soil & Water Conservation Districts and the Natural Resources Conservation Service.

SURVEY RESULTS

Stream Walk survey results are summarized in a table format (Attachment B). All nine (9) segments identified originally were surveyed. In all but two cases, the entire segment was surveyed. Each segment summary includes data and notes recorded on the survey sheets. Topographic and orthophoto segment maps are included with the summary table. Selected stream walk photographs are provided in Attachment C.

The summaries provide a good picture of the general condition of the River, existing and potential recreational uses, and possible areas of concern requiring further investigation. As the technical expertise of the volunteers varies, so do the descriptions. Some volunteers were more thorough than others and noted additional information.

Observations about the River include:

- ◆ The River's profile is most commonly gently sloped (1-3%), with a glide flow or pool-riffle sequence. Exceptions included several cascade and step-pool sequences in the upstream segments, most notably Chapman Falls.
- ◆ Stream bank cover included a variety of vegetation, with deciduous trees and small trees and shrubs most abundant. Lawns were noted infrequently, though more prevalent in the two most downstream segments.
- ◆ Invasive non-native species were present in the downstream segments (#s 4 – Jones Hill to Dolbia Hill Roads, and 6-9 – Norwich Salem to Joshuatown Roads). Those noted include multiflora rose, purple loosestrife, Japanese barberry, oriental bittersweet and wild grape.
- ◆ Riparian buffers were commonly >100 feet in width. In two segments, however, buffers were <25 feet (3 – Foxtown Road to Jones Hill Road, and 6 – Norwich Salem Road to Hamburg Road).
- ◆ The water condition was clear with no smell, with a few exceptions. In segments 1 and 2, the most upstream River segments (Geoffrey to Foxtown Roads), water was noted as “yellow-brown” and sometimes “foamy”. In addition, in the upper section of segment 8 (Macintosh to Mt. Archer Roads), surveyed both after a rainstorm and when dredging was being done in the Lyme swimming area just upstream, water color was noted as “turbid”.
- ◆ Algae and aquatic plants were noted most frequently as either “absent” or “in spots”. Exceptions include Peck Meadow Pond in segment 1, and an area of Moulsons Pond in segment 8, where aquatic plant growth was noted “everywhere”.
- ◆ Substrate materials were primarily cobbles, gravel, sand and boulders, with the exception of slower, impounded areas where silt/clay and organic material were dominant.
- ◆ Primary land uses include Undeveloped (forested), Open Space (protected), Rural Residential, with some Agricultural, Non-residential Roads and Recreational.
- ◆ Potential sources of contamination identified were primarily lawns/gardens, roads, and farms/nurseries. Other potential concerns noted included beavers, eroding stream banks, dying hemlocks, lawns mowed to the stream, storm drains, log jams, dams and water being pumped from the river.
- ◆ Known and potential recreational opportunities included canoeing/kayaking, picnicking, swimming, fishing and hiking.
- ◆ Reports of wildlife were varied, with many detailed listings and some surveys with no listings at all (completing the section on wildlife was optional). Based on reports the river supports a variety of wildlife.

Stream Walk observations raise several issues related to water quality and watershed management:

- ◆ In areas where the width of riparian vegetation is less than 25 feet, and lawns, roads, and cow pastures exist near the river, buffering from adjacent activities may not be adequate.
- ◆ The presence of non-native invasive species, which appear to be moving into downstream areas of the River, suggest the need for eradication and restoration projects before they spread, as well as education about the harm caused by use of non-native invasives in landscaping.
- ◆ Though the River does not exhibit signs of nutrient loading (excessive algae or aquatic plant growth), possible threats from adjacent lawns, if fertilized, and agricultural activities do exist.
- ◆ Dying hemlocks appear to be threatening the stability of steep banks along areas of the River.

RECOMMENDATIONS

The information collected from the Stream Walk Survey not only provides a baseline against which we can measure future changes, but also can be used for planning purposes for local and watershed-based improvement and protection efforts. While the Eightmile River is still in a relatively pristine condition, a number of potential concerns and threats to the health of the river were identified in the survey. They include inadequate stream buffers, adjacent agricultural uses, lawns mowed to the edge of the river, dying hemlocks and resulting unstable banks, non-native invasive plant species, and storm drain runoff. If addressed in a timely way, the river can be protected from degradation, avoiding costly restoration and improvement efforts in the future.

As a follow-up to the Eightmile River Stream Walk Survey, general recommendations include:

- ◆ Complete the collection of baseline information by surveying the East Branch of the Eightmile River and additional streams in the watershed;
- ◆ Investigate potential river access areas identified and assess both the need for and feasibility of development;
- ◆ Develop and implement a community education program to inform residents and streamside property owners of the importance of maintaining naturally vegetated stream banks;
- ◆ Investigate areas of concern identified to determine the extent of problems and to plan improvements;
- ◆ Identify areas for non-native species eradication and restoration projects and educate residents, nurseries and landscapers about the harm caused by use of non-native invasives in landscaping;
- ◆ Community members interested in the health of the river should
 - contact their municipal government to urge education of residents, restoration of degraded areas, and improved river protection regulations (e.g. minimum setbacks)
 - support the efforts of the Eightmile River Watershed Project
- ◆ Monitor segments periodically to assess conditions. This could be accomplished through a stream segment adoption program whereby volunteers make visual observations on an annual basis and file a written status report.

For assistance and further information, please contact:

*Middlesex County
Soil and Water Conservation District
deKoven House – 27 Washington Street
Middletown, CT 06457
860/346-3282*

*Eightmile River Watershed Project
UConn Cooperative Extension System
1066 Saybrook Road
Haddam, CT 06438
860/345-4511*

ACKNOWLEDGEMENTS

The Eightmile River Watershed Stream Walk Survey would not have been possible without the assistance of numerous volunteers and cooperating agencies. Our sincere thanks to all of the following who contributed to the survey project. *Special thanks to Middlesex County Soil & Water Conservation District intern Jason Bobko, whose assistance with various aspects of the Stream Walk project was key to its success.*

Stream Walk Survey Team Volunteers

Mary Augustiny
David and Anne Bingham
Ed and Linda Bireley
Vivian Blackford and William Cuddy
Fred Bliven
Russ and Shelley Bochain
Frederick Brumder
Dennis Coleman
Jan Royce Conant
Ralph Crispino (DRA/LLC)
East Haddam Fish and Game Club – Dave Gilchrist, John Dibble, Peter Jachym, Wright Palmer
Sue Hessel
David and Jackson Holahan
Anthony Irving
Robert and Kimberly Kanabis
Barbara Kashanski
Prescott Littlefield
Ronald Olansen
Mac Thames

Cooperating Organizations, Businesses and Municipalities

Eightmile River Watershed Committee: Special thanks to members *David Bingham, Nathan Frohling, Anthony Irving, and Frank Skwarek*, who assisted in planning the Stream Walk, finalizing the survey form, and reviewing the landowner mailing and training flyer.

Municipalities of East Haddam and Lyme: Special thanks to *Jim Ventres*, East Haddam, and *Fred Bliven* and *Frank Skwarek*, Lyme, who researched and compiled information for the riparian landowner database and helped recruit volunteers, and to the *Town of Lyme*, which hosted the volunteer training session at its town hall.

Natural Resources Conservation Services: Special thanks to *Javier Cruz*, who wrote the Quinebaug River Survey Streamwalk Training Manual that we adapted for our use; *Seth Lerman*, who provided us with a copy of the training video; and *Fernando Rincon*, who lent us slides for the training.

University of Connecticut Cooperative Extension System: Special thanks to *Leslie Kane*, who provided critical support to the project by coordinating with the Eightmile River Watershed Committee, orienting and working with intern Jason Bobko, and planning the overall project (among many other things), and *Joel Stocker*, whose assistance with the GIS mapping was also instrumental to the project.

Funders

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Attachment A

Stream Walk Survey Form

EIGHTMILE RIVER WATERSHED STREAM WALK SURVEY

NAME(S): _____ NAME OF STREAM: _____
 _____ CURRENT WEATHER: _____
 PHONE(S): _____ PREVIOUS 3 DAYS WEATHER: _____
 DATE: _____

DID YOU SURVEY THIS WHOLE SECTION OF THE STREAM? YES NO – Which section(s) were not surveyed? Why?

Make all observations facing DOWNSTREAM.

NOTE: Items marked with an asterisk (*) may indicate an area of concern. If observed, you may need to describe further on the attached Areas of Concern sheet.

1. Section code (e.g. 1A): _____ Locate starting point of section on map, and label using section code letter (e.g. – A)

Describe location and extent of section (i.e. from ___ to ___). If possible, use landmarks and road names.

2. AVERAGE WATER DEPTH _____ feet AVERAGE WATER WIDTH _____ feet

3. HOW WOULD YOU DESCRIBE THIS SECTION OF THE STREAM? CHECK ANY THAT APPLY:

- A. _____ Cascade _____ Step-Pool sequence _____ Pool-Riffle sequence _____ Glide
- B. _____ Steep (slope > 3%) _____ High Gradient (1% ≤ slope ≤ 3%) _____ Flat (slope < 1%)
- C. _____ Closely associated with an inland or riverine wetland (marsh, meadow, swamp).
 _____ Flood control or water reservoir area or lake (>5ac.)
 _____ Piped* _____ Channeled* _____ Lined (stone, concrete)*
 _____ Other (describe): _____

4. STREAMBANK COVER/VEGETATION:

<i>Type</i>	<i>Few</i>	<i>Common</i>	<i>Abundant</i>	<i>Absent</i>
Conifers (pines, higher than 20 ft.)	_____	_____	_____	_____
Deciduous (oaks/maples, higher than 20 ft.)	_____	_____	_____	_____
Small trees and shrubs (smaller than 20 ft.)	_____	_____	_____	_____
Grasses/Emergent (cattails/rushes)	_____	_____	_____	_____
Lawns*	_____	_____	_____	_____
Natural Rock/Ledge	_____	_____	_____	_____
Artificial (concrete/riprap/walls/buildings)*	_____	_____	_____	_____
Non-native invasive plants (purple loosestrife, phragmites, other? – please note)	_____	_____	_____	_____

Are streambank soils mostly exposed? Yes* No

Does vegetation appear natural or cultivated? _____

5. LOOKING DOWNSTREAM, ESTIMATE THE AVERAGE, UNINTERRUPTED, WIDTH OF RIPARIAN VEGETATION:

Right side: _____ <25'* _____ 25-100' _____ >100'
Left side: _____ <25'* _____ 25-100' _____ >100'

6. ESTIMATE THE NUMBER OF:

Impoundments (Small ponds, Dams)* _____ Discharge pipes* _____ Stream crossings _____
*Height of Dam:

7. VISUALLY DESCRIBE WATER CONDITIONS:

_____ Clear _____ Turbid* _____ Green* _____ Rusty - Red*
_____ Yellow - Brown* _____ Foamy* _____ Oil Slicks* _____ Milky*

If water is a color other than clear, does anything appear to be affecting water quality?

YES* NO

COMMENTS:

8. DESCRIBE AQUATIC VEGETATION:

A. ALGAE GROWTH:

Where?	_____ Absent*	What kind?	_____ Floating	_____ Matted on substrate
	_____ In spots		_____ Hairy	_____ Brown
	_____ Everywhere		_____ Scum	_____ Green

B. Large Aquatic Plants:

Where?	_____ Everywhere*	What kind?	_____ Floating free (duck weed)	_____ Submerged rooted (eel grass)
	_____ In spots		_____ Floating rooted (water lily)	_____ Emergent (cattails, rushes)
	_____ Absent		_____ Submerged free (coontail, milfoil)	

Does anything appear to be contributing to the algae blooms (discharge pipes, runoff)?

YES* NO

COMMENTS:

9. APPROXIMATE COMPOSITION (%) OF SUBSTRATE MATERIALS (SUM SHOULD EQUAL 100%):

_____ % Silt or Clay (smooth)*	_____ % Sand (gritty)*	_____ % Gravel (.1-2")
_____ % Cobbles (2-10")	_____ % Boulders (>10")	_____ % Bedrock
_____ % Concrete or Riprap	_____ % Organic (plant debris, muck, shells)	

Does anything appear to be contributing to excessive fine sediment deposits on the stream banks or sediment deltas (storm pipe outlets, tributaries, or runoff)?

YES* NO

COMMENTS:

10. DESCRIBE THE SMELL OF WATER AND SEDIMENTS:

_____ None _____ Rotten Eggs* _____ Sewage* _____ Musky
_____ Oil/Gas* _____ Other (describe):

11. IMMEDIATELY ADJACENT LAND USES:

Label: 1 = most 4 = least

Rural Residential Suburban Agricultural Industrial
 Urban Residential Forest Commercial Recreational
 Schools Non Residential Roads Protected Open Space

12. INDICATE SPECIFIC POTENTIAL SOURCES OF CONTAMINATION ALONG THE STREAM:

Lawns/Gardens Parking Lots Roads
 Commercial Dumpsters Farms/Nurseries Yard Waste
 Golf Courses Failing Septic System Other (describe):

13. RECREATIONAL USE AND OPPORTUNITIES:

Visible human activities as evidenced by litter, bike and hiking trails, roads, camping areas.

Do you see people using the river for recreation? How many? Describe activities.

Potential off road parking within 500 ft of the stream

Existing or potential access to the stream without disturbance to residents.

Watercourse is at least 10 feet wide and 1 foot deep, and for the most part is free of obstructions for non-powered boating. Describe any visible boating activity.

14. (Optional) FISH AND WILDLIFE - IF YOU ARE ABLE, LIST AND ESTIMATE NUMBERS OF ANY FISH AND WILDLIFE THAT YOU CAN IDENTIFY UNDER THE FOLLOWING CATEGORIES, AND MAKE NOTE OF NESTS AND NESTING BOXES:

- A. Birds of Prey (osprey, hawks, etc.)
- B. Water Fowl (wood ducks, mallards, Canada geese*, etc)
- C. Riverine Fur-Bearers (muskrat, beaver, otter, etc.)
- D. Water Birds (herons, egrets, etc.)
- E. Song Birds & Other Small Birds (black birds, robins, blue jays, etc.)
- F. Amphibians & Reptiles (salamanders, snakes, etc.)
- G. Fish (trout, bass, alewife, etc.)
- H. Aquatic Insects (mayflies, stoneflies, caddisflies, etc.)
- I. Mollusks (clams, mussels, snails)

15. ADDITIONAL COMMENTS OR OBSERVATIONS:

Please return completed surveys and film to the Middlesex County Soil and Water Conservation District, deKoven House, 27 Washington Street, Middletown, CT 06457

Further Description of Areas of Concern

Site Number	Type of Concern(s)	Description of Location (Locate & Label on Map)	Description of Site

Label: Assign a number to each area of concern you identify starting with the number 1.

Areas of Concern: Excessive algae growth, Barriers to fish passage (dams, culverts above low flows, obstructions higher than 8 inches), Litter, Sedimentation, Streambank erosion, Lack of riparian vegetation, Discharges (from pipes or channels), Channelization or Streambank manipulation, etc.

Location: Approximate distance and direction from nearest landmarks (i.e.- Roads, Buildings, Power lines, etc.)

Description: Describe conditions - water colors, smells, algae and large aquatic plant growth, adjacent land uses, potential sources of contamination, etc.

INSTRUCTIONS:

The purposes of this form are to collect information about the overall characteristics of a particular section of the stream, and to identify areas of concern where restoration efforts can be pursued. **A separate survey sheet should be filled out every time you observe abrupt changes in the physical characteristics of the stream** (gradient, width, depth, substrate materials, stream bank vegetation, channel pattern, etc.), which would indicate that you are in a different section of the stream. Use questions 2, 3, and 4 as guidelines.

The minimum length of a stream section should be **1000 feet**. Large ponds (>5 acres), lakes, or reservoirs should have a separate survey sheet.

Write the name of the stream as it appears on the topographic map. If the stream does not have a name, write **unnamed**, and describe its location. Use capital letters in alphabetical order to label stream segments as you survey the stream. Make sure to mark the segments on the topographic map. Because the survey may be conducted by canoeing or walking, **observations should be recorded facing downstream** to maintain consistency.

1. With as much detail as possible describe the location and the extent of the area that is being covered. When possible, use road names or landmarks.
2. Measure or estimate the average water width and depth of the stream.
3. Select the statements that best describe this section of the stream. If you do not feel it meets the provided descriptions, describe under *other*.

Cascade: narrow and steep channel, fast turbulent flows, rocky substrate. **Step:** Steep stairway pattern channel, fast turbulent flows, large substrate materials. **Riffle:** shallow fast running water, substrate mostly composed of cobble and gravel. **Pool:** slow flowing area, deeper than adjacent areas, but not wide enough to change the character of the stream (not a pond). **Glide:** section with smooth flowing deep water, substrate materials tend to have little influence on the flow of surface water.

4. Describe the presence and type of streamside cover. This description helps define the section's ecosystem and health.
5. **Riparian** zones are areas adjacent to watercourses. Riparian vegetation refers to the plants that naturally occur in riparian zones. Lawns and mowed areas should not be considered natural riparian vegetation. Estimate the uninterrupted width of riparian vegetation on both sides of the stream.
6. As you walk, keep count of any discharge pipes, small ponds (<5 acres), and dams. At the end of the section, record the total numbers observed.
7. Color and clarity of water could indicate pollution problems in the stream. Also note floating foam or slicks in the water.
8. **Algae** are mostly single cell plants. They can color the water green, and they can grow in colonies that can form long filamentous bodies or can form a mat on the stream's substrate. Algae are usually green and slimy and do not have any visible structural characteristics. Algae growth can point to nutrient problems in the stream. **Aquatic plants** are visible to the naked eye and have distinct features such as stems, leaves and flowers. Their presence is a sign of biological productivity and of slow water flows.
9. **Substrate:** the material that makes up the bottom (or floor) of a stream. There is a direct relationship between the stream's substrate and the rate of water flow. The composition of the substrate is indicative of fish habitat quality. Visually estimate in percentage the relative proportion of each of the substrate types listed.
10. **Odors** - Describe how the stream smells.
11. Adjacent land uses can impact the water quality of a stream, especially through storm water discharges. Concentrate on describing the areas closer to this section of the stream. Label the four most abundant land uses, using 1 for the most abundant land use and 4 for the least.
12. Indicate, from your observation, possible sources of contamination along the stream.
13. If people are currently using the stream, describe this. If you see opportunities for recreational use, please describe.
14. (Optional) If you are familiar with wildlife please fill out this section to the best of your ability.
15. Please make note of any additional observations not noted in the preceding spaces.

Additional Sheet: Areas of concern are sections of the stream where the physical characteristics are indicative of conditions adverse to aquatic life and human uses. The impairment should affect at least 50 feet of the stream. Use numbers to label every area of concern you identify starting with the number 1.

NOTE: Sewage spills should be immediately reported to town officials. Oil or chemical spills should be immediately reported to DEP at (860) 424-3338.

Attachment B

Summary of Survey Data

**Connecticut River Watch Program
1999 Eightmile River Stream Walks – Summary of Survey Data**

<i>Segment Number & Location</i>	<i>Date(s) Surveyed</i>	<i>Avg. Width (feet)</i>	<i>Avg. Depth</i>	<i>Stream Profile</i>	<i>Stream Bank Cover/Vegetation *invasive species</i>	<i>Buffer Width (feet)</i>	<i>Dominant Substrate Materials</i>	<i>Primary Land Uses</i>	<i>Recreation</i>	<i>Wildlife</i>	<i>Potential Concerns/ Sources of Contamination</i>
1 Geoffrey Road to unpaved road	10/3/99	6–100	2–3 feet	Varied: Step-pool, pool riffle, glide, some cascade Varied slope	Deciduous trees Small trees/shrubs Grasses/emergent Natural Rock/Ledge	>100	No Data	Undeveloped (forested) (E. Haddam Fish & Game Club land)	possible canoe/kayak	hawks, abundant waterfowl, heron (5 or 6), songbirds & other small birds, abundant aquatic insects	Yellow-brown, foamy water Dams (fish passage) Large aquatic plants everywhere
2 unpaved road to Foxtown Road (not all surveyed)	10/30/99 and 11/14/99	3–50	3–4 feet	Varied: 1° pool riffle & glide, with some step-pool & cascade Varied slope	Deciduous trees Small trees/shrubs Grasses/emergent Natural Rock/Ledge	>100	Silt-clay & gravel	Undeveloped (forested) (E. Haddam Fish & Game Club land)	none recorded	No Data	Yellow-brown water Algae Dams (fish passage) Beavers
3 Foxtown Road to Jones Hill Road	9/19/99	10–50	1–3 feet	Pool-riffle, with some cascade & step-pool in upstream section Slope primarily flat, except in steep upstream section (Chapman Falls)	Deciduous trees Small trees/shrubs Conifers Grasses/emergent Natural Rock/Ledge Lawns	<25 for the most part, varied up to >100 in some sections	Mixture of bedrock (at Falls), boulders, gravel, cobbles, sand	Open Space Recreation Rural residential (Devil's Hopyard State Park)	canoe/kayak, picnicking, fishing, hiking	blue heron, songbirds & other small birds, frogs, snake, evidence of beaver	Parking lots Roads Bank erosion Sediment deltas Dying hemlocks Lawns Exposed stream bank soils
4 Jones Hill Road to Dolbia Hill Road	9/5/99	20	0.5–1 ft.	Varied: Step-pool, pool-riffle & glide Slope primarily flat	Conifers Deciduous trees Small trees/shrubs Grasses/emergent Bittersweet* Japanese Barberry*	>100 for the most part, 25–100 in some sections	Cobbles & boulders	Open Space (TNC and E. Haddam Land Trust preserves)	none recorded	frogs, trout, minnows, clam shells, barred owl feather	Salt & sand runoff Bank erosion Log jam Roads Parking lots Dying hemlocks
5 Dolbia Hill Road to Norwich Salem Road	9/5/99	20–36	0.5–1.5 feet	Pool-riffle & Glide Flat slope Associated with riverine wetland	Conifers Deciduous trees Small trees/shrubs Grasses/emergent Lawns	varied from <25 to >100	Cobbles w/ boulders, gravel & sand	Agriculture Rural residential Undeveloped (forested) Recreation	swimming, fishing, hiking, horseback riding, bird-watching potential parking and access	hawks, osprey, wild turkeys, wood ducks, Canada Geese, mallards, great blue heron, egret, song-birds, trout, minnows, aquatic insects, clams, mussels, water snake, wood turtle, frogs, salamanders	Cow pastures adjacent to river Animal access to river Roads Bank erosion Lawns to stream Water being pumped out of river

**Connecticut River Watch Program
1999 Eightmile River Stream Walks – Summary of Survey Data**

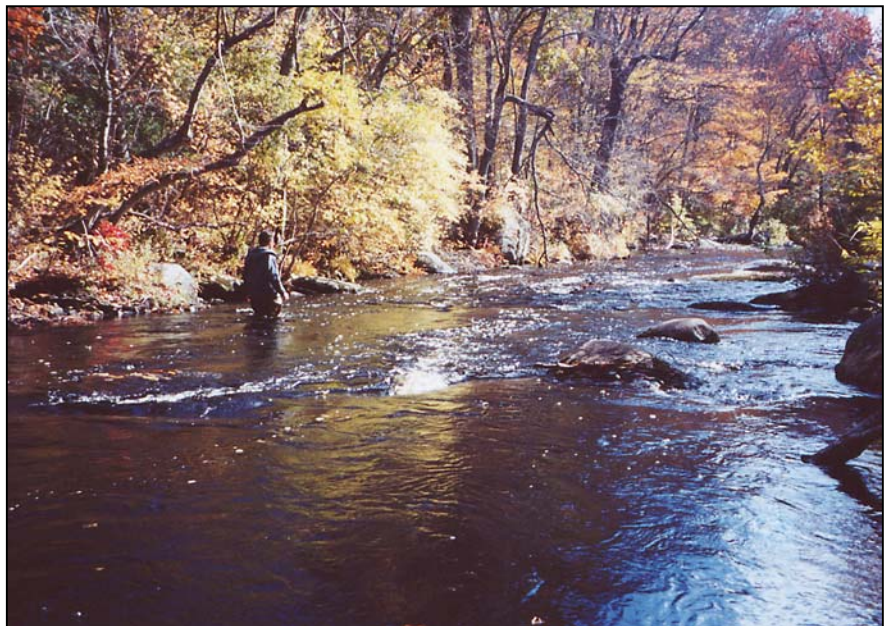
<i>Segment Number & Location</i>	<i>Date(s) Surveyed</i>	<i>Avg. Width (ft.)</i>	<i>Avg. Depth</i>	<i>Stream Profile</i>	<i>Stream Bank Cover/Vegetation *invasive species</i>	<i>Buffer Width (ft.)</i>	<i>Dominant Substrate Materials</i>	<i>Primary Land Uses</i>	<i>Recreation</i>	<i>Wildlife</i>	<i>Potential Concerns/ Sources of Contamination</i>
6 Norwich Salem Road to Hamburg Road	9/5/99	12–20	0.5–1 ft.	Pool-riffle & Glide Flat slope	Conifers Deciduous trees Small trees/shrubs Japanese Barberry* Wild Grape* Artificial	<25	Cobbles & gravel, some sand	Undeveloped (forested) Rural residential Non-residential roads	hiking, swimming, fishing potential parking and access	evidence of deer and beavers, crows, frogs, minnows, clams, mussel shells	Road runoff Small dams Pipe in river attached to pumphouse
7 Hamburg Road to Macintosh Road	10/11/99	30–50	1.5–3 ft.	Pool-riffle & Glide Flat slope Extensive field and forest floodplains	Deciduous trees Small trees/shrubs Grasses/emergent Lawns Multiflora rose* Bittersweet* Japanese Barberry*	>100, 25–100 in section adjacent to Hamburg Rd.	Cobbles & gravel, some sand & boulders	Undeveloped (forested) Agriculture Rural residential Non-residential roads Open Space (TNC & Lyme Land Trust preserves)	canoe/kayak , fishing, hiking trails potential parking and access	woodcock, mallards, wood ducks, bluejays, nuthatch, crow, starlings, water pennies, caddisfly, evidence of beaver, otter, deer	Roads Beaver dams Farms
8 Macintosh Road to Mt. Archer Road	9/11/99	10–60	2–5 feet	Pool-riffle & Glide Flat slope Associated with riverine wetland and impounded in lower sections	Deciduous trees Conifers Small trees/shrubs Lawns Artificial Natural rock/ledge Non-native invasive plants (purple loosestrife, other?)	varied from <25 to >100	Cobbles & gravel in upper sections; Organics, silt & clay in lower sections	Rural residential Agriculture Undeveloped (forested) Non-residential roads	canoe/kayak	hawks, Canada Geese (many), heron, blackbirds, robins, bluejays, trout, bass, school of small fish, clam shells	Rip rap Cornfield near stream Lawns mowed to stream Swimming hole work Large aquatic plants everywhere Pump drawing water from river
9 Mt. Archer Road to Joshuatown Road (not all surveyed)	9/8/99 and 9/9/99	55–60	2 feet	Pool-riffle High gradient and flat slope	Deciduous trees Conifers Small trees/shrubs Grasses/emergent Lawns Artificial Purple loosestrife*	>100 for the most part	Cobbles & boulders	Rural residential Undeveloped (forested) Agriculture Non-residential roads	fishing, canoe/kayak potential parking and access	turkey vultures, osprey, hawks, wood ducks, mallards, Canada geese, beaver, heron, egret, blue jays, turtles, trout, alewife, mussels	Log jams Algae Lawns mowed to stream Roads Storm drains Erosion Dying hemlocks

Attachment C

Stream Walk Photographs



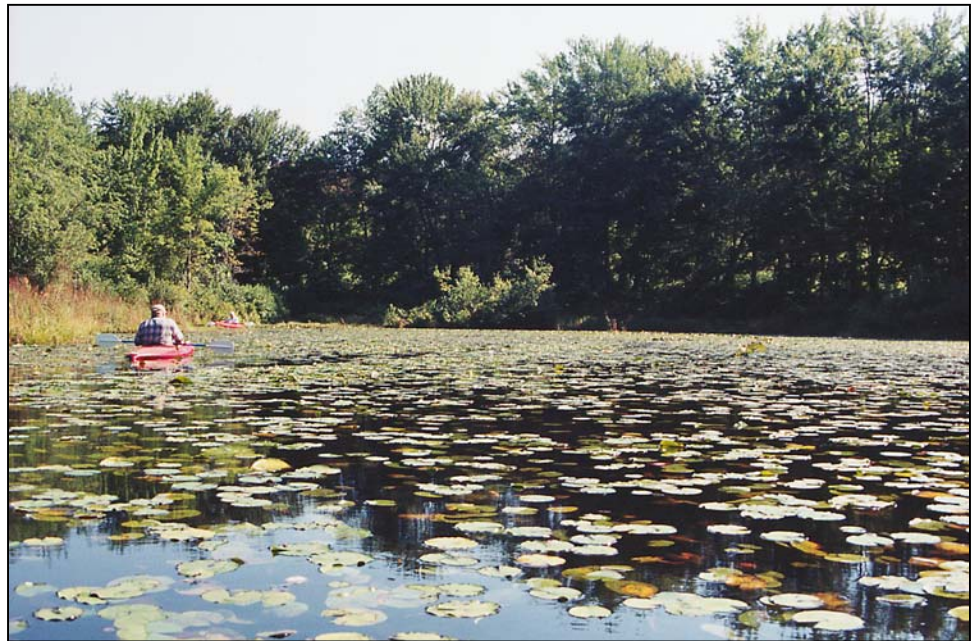
The upstream segment of the Eightmile River in East Haddam is surrounded by forested land owned by the East Haddam Fish and Game Club, protecting it from the impacts of human development



Further downstream in Lyme, this turbulent, rocky section of the Eightmile flows through a preserve owned by The Nature Conservancy.



Surveyors prepare to embark on their survey of the river in Lyme by kayak. Lawns adjacent to the river were more common in the two most downstream segments in Lyme.



Aquatic plants were abundant in this quiet embayment in the Moulsons Pond area in Lyme



Log jams, such as this one photographed in the most downstream segment of the Eightmile in Lyme, were noted in several segments surveyed