

HOUSATONIC WATERSHED HABITAT CONTINUITY IN NORTHWEST CONNECTICUT

PROPOSAL TO THE NATURAL RESOURCE DAMAGES FUND

Draft Concept by the Housatonic Valley Association

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OVERVIEW:

The Housatonic Valley Association (HVA) is proposing to *Restore River and Stream Continuity via Assessment and Prioritization of Culvert Replacement in the Housatonic River Watershed in Northwest Connecticut.*

HVA has secured the participation of partner organizations including the regional land conservation organization Weantinogue Heritage Trust (Weantinoge) which is the largest private regional land trust in northwest Connecticut; the University of Massachusetts at Amherst, developer of the Conservation Assessment and Prioritization System (UMass CAPs) for culverts; and the Inland Fisheries Division of Connecticut Department of Energy and Environmental Protection (DEEP IFD), which possesses years of experience and technical expertise related to culvert assessment and replacement in Connecticut. The Connecticut Department of Transportation is interested in participating in an advisory capacity, and building the assessment results into their maintenance planning. The following is a brief overview of what we would like to accomplish over a 3 year period. If the Natural Resource Damage Fund Trustees are interested in supporting this initiative, HVA will prepare a full grant proposal for Trustee consideration, including a refinement of the geographic target area.

GOAL:

The goal of this project is to protect and enhance the ecological integrity of cold water streams in the Housatonic Watershed of northwest Connecticut.

TASKS:

1. Identify in-stream barriers to fish and wildlife passage at state, local, and select private (i.e. Weantinoge owned) road crossings located on cold water streams of the Housatonic Watershed in northwest Connecticut.
2. Evaluate and score each stream's ecological value;
3. Identify those sites where culvert replacement would yield the most ecological benefits;
4. Identify the nexus between Tasks 1- 3 above and scheduled near-term culvert replacements by the Connecticut Department of Transportation, municipal Departments of Public Works and Weantinoge.
5. Ensure that those culverts replacements adhere to Stream Crossing Guidelines (IFD DEEP (February 26, 2008) to ensure that replacements enhance, restore and protect stream habitat, and fish and wildlife passage.

The project will assess culvert barriers to fish and wildlife passage at state and town road crossings, and private road crossings owned by Weantinoge, of cold water tributaries to the Housatonic River in northwest Connecticut. The project's geographic target area includes all 'cold water' tributaries to the Housatonic River mainstem located between the Massachusetts state line and the town of New Milford, Connecticut (i.e. approximately 11 towns). This area may be further refined based upon the actual number of culverts, technical input from project partners (e.g. CT DEEP IFD and ConnDOT) and available resources. Assessment of these culverts will facilitate prioritization of culvert replacement and stream restoration efforts, in order to improve fish and wildlife passage and provide continuity of habitat for a range of aquatic and terrestrial species. Budget permitting, the program will also include replacement of one or more culvert barrier(s) to fish and wildlife passage.

Culvert improvement is one of the few tangible restoration techniques that can immediately improve the ecological continuity of the Housatonic River system, and therefore accelerate the recovery of the ecological community injured by PCB contamination. This proposed project will require 36 months, including planning and implementation.

1. Project Goals and Objectives

The primary goals of the Housatonic Watershed Habitat Continuity Project are to:

- a. Using trained staff and volunteers, locate and assess the culverts in the Housatonic watershed in northwest Connecticut on cold water streams.
- b. Prioritize habitat continuity barriers caused by culverts (and thus, identify the most important culverts to improve or replace), using the software program developed by UMASS Amherst, Conservation Assessment and Prioritization System (CAPS).
- c. Work with the Connecticut Department of Transportation and municipal departments of public works to improve or replace those high-priority culverts.

2. Project Benefits

As long linear ecosystems, rivers and streams are particularly vulnerable to fragmentation. Most existing culverts were designed decades ago with little consideration for ecosystem processes and needs. Today, many culverts are seasonal or year round barriers to the movement of aquatic and terrestrial organisms. The fragmentation of the Housatonic's coldwater tributaries is of particular concern, as these streams serve as vital thermal refuges for sensitive fish species, including native brook trout.

According to the DEEP IFD, the most common stream crossing problems include perched culverts, shallow water depth, excessive water velocity and debris accumulation. Perched crossings are above the level of the stream bottom at the downstream end. Perching can result from either improper installation or from years of downstream bed erosion. Perched and incorrectly sized culverts cause low-flow and warm-water conditions in stream, affecting fish spawning behavior and success, and reducing the overall habitat value of cold water streams. As culverts are replaced,

consideration will also be given to the more frequent and intense storms associated with climate change in the Northeast, as many culverts are currently undersized for anticipated increases in storm flows.

Undersized crossings restrict natural stream flow, particularly during flood events, causing several problems, including scouring and erosion, high flow velocity, clogging and ponding. Similarly, shallow crossings have water depths too low for many organisms to move through them and may lack appropriate bed material.

Ideally, all road crossings in the project area would eventually be replaced with functional culverts that span both the stream and adjacent banks. Properly designed culverts will mimic, if not retain, natural in-stream conditions, and will hold a natural streambed with no noticeable change in the river flow or water velocity. Crossings should also be large enough to pass all fish species in the stream system, not just the biggest and strongest.

Restoration of river and stream continuity via culvert replacement has tremendous potential to protect and enhance the ecological integrity of these cold water streams. However, given the cost of culvert replacement, it is essential that restoration resources be targeted at crossing structures in a way that provides the greatest possible ecological benefit, on the highest quality cold water streams. This project proposes to use a UMASS-developed landscape modeling tool (CAPS) coupled with stream quality assessments by the DEEP, and the culvert replacement schedules of ConnDOT, municipal road departments and Weantinoge, to set priorities for culvert replacement in the Housatonic River watershed. In doing so, we will ensure that near-term culvert replacements will restore the greatest degree of ecological function and fish and wildlife passage to these coldwater streams.

The remediation of culvert barriers will benefit the community and environment by

- Restoring in-stream habitat;
- Improving passage of fish and other wildlife that move through culverts;
- Improving water quality, including restoration of ideal water temperatures and oxygen levels;
- Restoring natural water velocities and depths, thereby reducing sediment transport;

Improving culverts is a proven, effective ecological restoration technique that restores or enhances water quality, aquatic species habitat, and the overall health and success of fish and wildlife populations.

3. Implementation Schedule

The anticipated schedule for the major activities is as follows:

Year One:

- 1) Refinement of focus area by partners based on resource availability/funding.
- 2) Locate and map high quality cold water stream culvert crossings in northwest Connecticut.
- 3) Volunteer recruitment.

- 4) Staff and volunteer training (using the UMass CAPS protocols.)
- 5) Culvert field assessment.

Year Two

- 6) Culvert field assessment.
- 7) Run CAPS model to evaluate ecological benefits of every culvert assessed in the focus area.
- 8) Confirm ownership of high priority-for-replacement culverts.

Year Three

- 9) Work with ConnDOT, municipalities and Weantinoge to schedule replacement of high priority culverts.
- 10) With funding, replace one or two culverts. If this is possible, include pre-replacement monitoring in Year Two, and post-replacement monitoring in Year Three.

4. Major Products:

- Electronic GIS data (on a disk) for the focus area based on CAPS analysis using field data that includes a prioritized list of crossing sites for restoration based on increased ecological value and quality of stream.
- A prioritized list of up to 100 combinations of culvert replacements in the focus area based on increased ecological value.
- Culvert Replacement Action Plan including owner, schedule and replacement design objectives for all high priority culvert replacements.
- Final report (hard copy and electronic on a disk) describing analyses conducted, summarizing results and containing the prioritized lists.

5. Coordination and Integration with Ongoing and Planned Activities

Our efforts for the protection of fish and critter passage will be coordinated and integrated with proposed or planned road work to the maximum extent possible. (HVA is currently working with ConnDOT, municipal and regional transportation agencies to ensure that our current culvert replacement recommendations are considered in road project planning.) Additionally, HVA will work with the road and highway planners to encourage the use of the Connecticut Stream Crossing Guidelines in all future transportation projects.

6. Estimated Cost:

We are requesting approximately \$174,408 in NRD funding over 3 years. It is estimated that at minimum an additional \$ 14,000 will be provided by HVA as match through the donation of at least 250 volunteer hours valued at \$27.77/hour (Independent Sector, CT, 2010). These estimates do not include expenses associated with culvert replacement in Year 3, which may range from \$45,000 to more than \$150,000 per replacement depending on site specific conditions. The NRD request breaks down as follows: \$101,908 for HVA project coordination and implementation; \$37,500 for Weantinoge Heritage for implementation; and \$35,000 UMass (please note that we are awaiting confirmation on this figure from Scott Jackson, UMass). Please refer to detailed budget below.

Budget Breakdown by Year:

YEAR ONE:

- **HVA Salary:** **\$ 33,984**

(Includes portions of HVA CT Water Protection Director, GIS manager, staff for oversight and training, and a special Project coordinator)

- Culvert identification/mapping
- Volunteer recruitment and training
- Culvert assessment
- Data verification and data entry (HVA/UMass database and GIS layer)

- **Contracted services** **12,500**

- Weantinoge Heritage – culvert assessment on Weantinoge holdings

- **Travel** **1,498**

- 4 trips/week @ average of 30 miles round trip @ \$.48/mi. x 26 weeks

- **Equipment/Supplies** (GIS camera/3 field computers/waders) **3,650**

TOTAL: \$ 51,632

YEAR TWO:

- **HVA Salary:** **\$ 29,790**

- **Contracted services** **47,500**

- Weantinoge Heritage - 12,500
- UMass - 35,000 (awaiting confirmation)

- **Travel** **1,498**

- **Supplies** (replacement tape measures, etc) **200**

TOTAL: \$ 78,988

YEAR THREE:

- **HVA Salary:** **\$ 29,790**

- **Contracted services** – Weantinoge Heritage **12,500**

- **Travel** **1,498**

TOTAL: \$ 43,788

THREE YEAR TOTAL: \$ 174,408