

Housatonic River Basin Natural Resources Restoration Project
Natural Resources Trustee SubCouncil for Connecticut
Request for Supplemental Information (RSI)
INSTRUCTIONS

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INLAND FISHERIES

PART A: SPONSOR AND PROJECT SUMMARY FORM

Please read "Request for Supplemental Information (RFI) OVERVIEW" and this document,
"Request for Supplemental Information (RSI) INSTRUCTIONS" before completing this form.

Part A must be completed using this "Sponsor and Project Summary Form"

SPONSOR INFORMATION

Type of Entity Check the box that best describes the sponsor.

- | | |
|--|--|
| ☐ Private individual | ☐ Municipal government |
| ☐ Non-profit organization | ☐ Corporation or Business |
| ☒ State government | ☐ County government |
| ☐ Federal government | ☐ Academic Institution |
| ☐ Tribal government | ☐ Other (explain) |

Authorized Representative of Sponsor

DEP Wildlife Division

Name

Greg Chasko

Title

Assistant Director, DEP Wildlife Division

Address

DEP, 79 Elm Street

City

Hartford

State

CT

Zip

06106-5127

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860-424-3494

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greg.chasko@po.state.ct.us

Contact Person (if different from Authorized Representative):

Name

Title

Address

City

State

Zip

Phone

Email

Project Name Provide a brief working name:

Wetland habitat restoration on the lower Housatonic River through the control of the non-native invasive plant, phragmites.

Project Location

Attach an 8.5 x 11-inch map or copy of an aerial photograph showing project location and extent. Include pertinent topographic and geographic information, a scale, and north arrow.

State(s), Municipality/ies: Primarily Milford and Stratford; Shelton, Orange and Derby to a lesser extent.

Longitude for approximate center of project area: -73.11601

Latitude for approximate center of project area: 41.28712

NOTE: If a specific location(s) has/have not been selected yet, include in Part C a narrative describing how project location(s) will be selected.

Restoration Priority Category See Appendix C of these Instructions for Restoration Priority Category Descriptions

Primary Category. Check the restoration category that is the primary goal of the project. Check one box.

- ☐ Aquatic Natural Resources Restoration/Enhancement
- ☒ Riparian & Floodplain Natural Resources Restoration/Enhancement
- ☐ Restoration/Enhancement of Recreational Uses of Natural Resources

Secondary Categories. Check all relevant boxes.

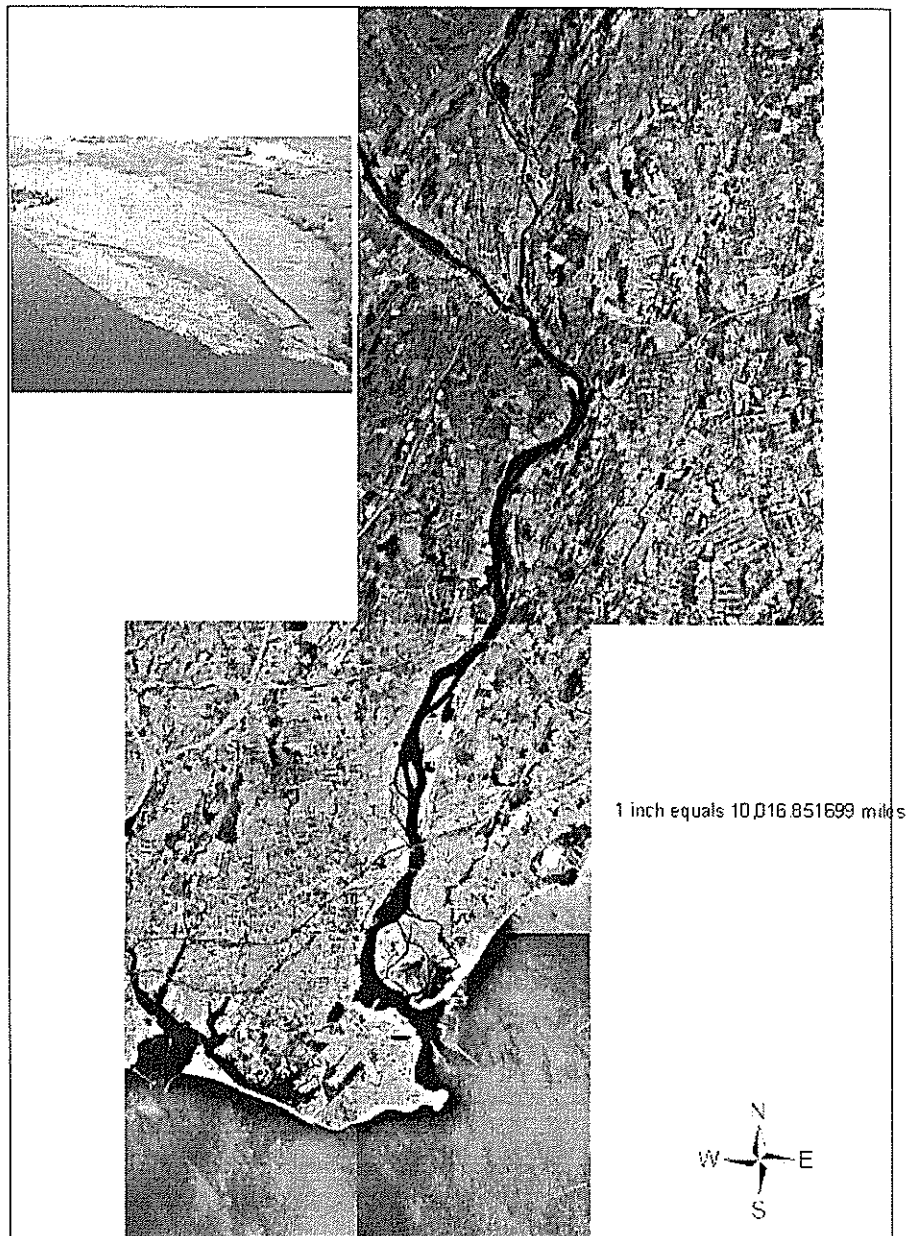
- ☒ Aquatic Natural Resources Restoration/Enhancement
- ☐ Riparian & Floodplain Natural Resources Restoration/Enhancement
- ☒ Restoration/Enhancement of Recreational Uses of Natural Resources

List Specific Injured Natural Resources and/or Impaired Natural Resource Services to Benefit from Project

PCBs have been documented to impact the fitness and survival of fish and wildlife. This project will help mitigate these negative impacts by restoring the habitat quality of 500 acres of wetlands in the lower Housatonic River ecosystem, thereby improving the fitness of fish and wildlife.

Project location: Latitude 41.28712, Longitude -73.11601

Phragmites control on the Lower Housatonic River



Project Budget Summary

Complete the table below to summarize the budget information that is detailed in Part D: Project Budget Narrative and Forms. Sponsors are advised to complete Part D (Project Budget Narrative and Forms) before filling in the table below.

Housatonic River NRD Funds – Requested	Other Contributions (Committed)	Other Contributions (Not Committed)	Total Project Cost (boxes 1+2+3)
1. From Part D, Table 2, Box 5 \$963,313.	2. From Part D, Table 2, Box 6 \$205,806.	3. From Part D, Table 2, Box 7	4. From Part D, Table 2, Box 8 \$1,169,119.00
	Amount of Other Contributions to Be Considered as Cost-Matching to NRD Fund Request		
	5. \$205,806.		

Authorizing Statement

I hereby declare that the information included in this project submission and all attachments is true, complete, and accurate to the best of my knowledge, and that the proposed project complies with all applicable state, local, and federal laws and regulations.

Greg Chasko 6/18/07
Signature of Sponsor or Sponsor Representative Date

Greg Chasko
Name of Sponsor or Sponsor Representative
(Type or print clearly)

Part B - Project Abstract

Project Name: Wetland habitat restoration on the Housatonic River through the control of the non-native invasive form of Common Reed or phragmites (*Phragmites australis* (Cav.) Trin. Ex Steud).

Goal: To restore native biodiversity and ecological integrity within the lower Housatonic River ecosystem.

Objective: Eliminate 500 acres of dense monocultures of the non-native invasive form of the plant phragmites (*Phragmites australis* (Cav.) Trin. Ex Steud) within the lower Housatonic River by herbiciding and mowing over a 3-year period (2008-2011).

PCBs have been documented to impact the fitness, survival and productivity of wildlife. This project will help mitigate negative impacts from PCBs by restoring 500 acres of wetlands thereby improving the fitness of fish and wildlife.

Existing tall (10-15'), dense monocultures of the non-native form of the invasive plant, phragmites, displace native vegetation resulting in decreased plant diversity and dramatically reduced use by wildlife. These stands also preclude public access to marshes and limit visibility.

This project is a physical restoration that is 100% implementation-oriented and will address all three restoration funding categories. Eliminating phragmites monocultures will:

- Restore the natural ecological structure and function of this ecosystem thereby increasing habitat quality and the survival and fitness of fish and wildlife.
- Allow a diversity of native plants, including rare species to re-establish, primarily in tidal marshes, but also in riparian and floodplain habitats.
- Dramatically increase wildlife use of these areas.
- Re-create scenic vistas.
- Enhance opportunities for public recreation.

Control of phragmites monocultures will be accomplished by ground application of herbicides over three consecutive growing seasons. Applications will be made in late summer and fall from low-ground pressure vehicles that traverse the soft, marsh soils without damaging them. Removal of dead stems by mowing will occur between herbicide applications. Pre-control monitoring of vegetation and waterbirds, and first-year herbicide applications will begin in 2008 and continue through 2011. Similar phragmites control projects that we have conducted elsewhere in Connecticut over the past 10 years have resulted in the successful restoration of diverse wetland ecosystems, including the re-colonization of several sites by state-listed threatened and endangered plants. Current partners for this project are: Connecticut Audubon, Ducks Unlimited and the Connecticut Waterfowlers Association.

Part C - Project Narrative

Project Name: Wetland habitat restoration on the lower Housatonic River through the control of the non-native invasive plant, phragmites.

1.0 GENERAL DESCRIPTION

1.1 Project Goals and Objectives

The primary goals and objectives of this proposed project must relate to those of the CT Sub Council (RFP, Section 2; particularly to: (a) "restore, rehabilitate, replace, or acquire the equivalent of the natural resources and/or their services that were injured or lost as a result of the release of hazardous substances, including PCBs, into the Housatonic River environment from the GE facility in Pittsfield, MA; and (b) provide for sustainable and measurable benefits to injured natural resources and services."

Goal: To restore native biodiversity and the ecological integrity within the lower Housatonic River ecosystem.

Objective: Eliminate 500 acres of the non-native, invasive form of the plant Common Reed or phragmites (*Phragmites australis* (Cav.) Trin. Ex Steud) within the lower Housatonic River by herbiciding and mowing over a 3-year period (2008-2011).

PCBs and other contaminants have been documented to impact the fitness, survival and productivity of wildlife. This project will help mitigate negative impacts from PCBs by restoring the habitat quality of 500 acres of wetlands within the lower Housatonic River (extending from the Derby dam, south to the mouth of the river) thereby improving the fitness of fish and wildlife.

The existing monocultures of tall (10-15 feet high), dense stands of phragmites that currently dominate this area are of low habitat value to wildlife, preclude access to marsh areas and limit visibility. Extensive stands of dead phragmites stems and litter also create a significant fire and smoke hazard in the winter. Eliminating these phragmites monocultures will allow desirable native plant communities to re-establish in tidal marshes, floodplain and riparian habitats, which in turn, benefits the fish and wildlife that use these areas.

Restoring these areas will also enhance recreational opportunities (e.g., boating, fishing, hunting, bird watching, nature photography) because wildlife use of the marshes will increase dramatically, access to the marshes will be improved and scenic vistas will be re-created. The public will further benefit from a reduced threat of marsh fires.

Benefits to natural resources resulting from this project will be both sustainable and measurable. It is DEP's Wildlife Division's goal to maintain in perpetuity all areas where phragmites control efforts have been conducted in Connecticut. Based on our experiences, even if no additional control was conducted after the completion of the 3-years of treatment proposed for this project, we expect that the overall effective period of control would be a minimum of 15 to 20 years.

To measure project success, two parameters that will be monitored are changes in vegetation and water bird use before and after (year 1, 2, 3) the proposed work. The DEP Wildlife Division will continue to monitor the phragmites and if necessary, will continue to perform spot treatments of herbicide and mowing beyond year three to control re-growth of phragmites.

1.2 Project Scope and Project Implementation Plan

The scope of the project should include a description of current conditions and desired future conditions.

Currently, approximately 500 acres of wetlands, floodplain and riparian areas on the lower Housatonic River are degraded by the presence of the non-native, invasive plant, phragmites. This plant has formed dense monotypic stands and displaced the native plant community in these tidal brackish and freshwater wetlands. This has resulted in negative impacts to the habitat value for the resident and migratory fish and wildlife species that use these areas. The desired future conditions will be reestablishment of a floristic community more closely resembling the historic brackish marshes characteristic in this area, which will in turn, provide the requisite habitat for native fish and wildlife species.

a. Brief description of the overall approach to the project implementation.

Prior to any commencement of work on private land, all property owners will be contacted by the CT DEP Wildlife Division's Wetland Habitat and Mosquito Management (WHAMM) Program or project partners and permission for land access will be requested. The phragmites will be sprayed with EPA and CT DEP registered herbicides using spray application equipment mounted on low ground pressure vehicles that can traverse the soft, marsh soils without damaging them. Note that where water salinities are high (≥ 18 ppt), phragmites can sometimes be controlled through the re-introduction of tidal water. Salinities on the Housatonic River are not this high and the only feasible option for phragmites control is herbiciding and mowing. The herbicide spraying will be conducted during the late summer months, from the mid to late growing season until the first hard frost (approx. June-October). Impacts to breeding birds will be avoided by conducting spraying in the late summer after most nests have fledged. If we observe late nesting activity at particular sites, we will schedule treatment of those sites in the fall. In the fall and winter following the spraying, the dead phragmites stems will be chopped into small pieces by mowing, thereby facilitating decomposition on the marsh and allowing sunlight to penetrate to the marsh surface to enhance native plant germination. First year application of herbicides should achieve 50-80% control. Follow-up year 2 and year 3 herbicide applications will further reduce phragmites cover until the native plant community can be reestablished and allowed to dominate community structure.

b. A project schedule. (Also see Table 1.2b: Project Schedule)

FY 2009-

- Contact property owners to inform and secure permission agreements.

- Establish vegetation transects and bird survey routes; pre-treatment transects will be surveyed and birds monitored.
- Take aerial and ground station photography of sites.
- Purchase herbicides and equipment required to do project.
- Hire staff needed to conduct herbicide spraying and mowing.
- First year spraying of 500 acres of phragmites; summer/fall 2008 (**milestone task 2008**).
- First year mowing of dead phragmites; fall/winter 2008-09 (**milestone task 2008**).

FY 2010-

- Bird and vegetation first year post monitoring; spring/summer 2009.
- Take aerial and ground station photography of sites.
- Second year follow-up spraying of reoccurring phragmites; summer/fall 2009 (**milestone task 2009**).
- Second year mowing; fall/winter 2009-2010 (**milestone task 2009**).

FY 2011-

- Bird and vegetation second year post monitoring; spring/summer 2010.
- Take aerial and ground station photography of sites.
- Third year follow-up spraying of remaining phragmites (**milestone task 2010**).
- Third year mowing; fall/winter 2010-11 (**milestone task 2010**).
- Bird and vegetation third year monitoring; spring/summer 2011.

PROJECT TITLE:	Table 1.2b: Project Schedule. Habitat Restoration on the Housatonic River Through The Control of the Non-Native Invasive Plant, Phragmites		
SPONSOR NAME:	The Connecticut Department of Environmental Protection		
Season	FISCAL YEAR 1 (July 2008-June 2009)	FISCAL YEAR 2 (July 2009-June 2010)	FISCAL YEAR 3 (July 2010-June 2011)
	Activity	Activity	Activity
Fall/Winter (2008)	-Obtain permission from private property owners -Purchase equipment -Hire needed staff. -Conduct public outreach (meetings, brochures)		
Spring	-Purchase herbicide -Pre-treatment monitoring birds (spring 2009) -Establish vegetation transects -Continue public outreach	- Monitor birds (spring 2010)	-Monitor birds (spring 2011)
Summer	-Monitor birds and vegetation -Herbicide 500 acres (*Milestone task 2008)	-2 nd -year herbiciding -Monitor birds and vegetation	-Monitor birds and vegetation - 3 rd -year herbiciding of reoccurring Phragmites
Fall	-Monitor birds and vegetation -Mow dead stems	-Complete 2 nd -year herbiciding (fall 2010) -Monitor birds and vegetation -Mow dead stems	-Complete 3 rd -year herbiciding (fall 2011) -Monitor birds and vegetation -Mow dead stems
Winter	-Continue/complete first year mowing (*Milestone task 2008-2009)	-Continue/complete 2 nd - year mowing	-Complete third year mowing

c. Discussion of major project phases. The majority of the tasks necessary to implement the proposed project will be conducted in the first fiscal year (FY 2009).

- The locations of phragmites monocultures occurring in the lower Housatonic River watershed (project area) will be identified and mapped through examination of aerial photographs, satellite imagery and ground reconnaissance.
- Most of the proposed activity will occur on public property (DEP or other state-owned lands). Where phragmites occurs on municipal or private property, landowners will be identified and letters of permission for access and project agreements will be obtained.
- Monitoring plots (vegetation transects and bird observation areas) will be established. Pre-treatment monitoring of vegetation and birds will commence in spring/summer 2009.
- Equipment (3 Land Tamer II® amphibious vehicles, sprayers, low ground pressure mower) and herbicides/surfactants will be purchased (refer to Table 1: Budget Summary by Fiscal Year in Part D).

- Due to the specific nature of this proposed project which is over and above existing WHAMM Program staff availability, additional personnel (2 durational Environmental Protection Maintainer 1) will be hired for the 3-year duration of this proposed project for spraying phragmites with herbicides in the summer and early fall, and mowing of the dead stems in late fall and winter. Due to the relatively short spray window (4 months), 4 seasonal employees will also be hired during the summer months to assist with the spraying (refer to Table 1: Budget Summary by Fiscal Year in Part D).
- During the first year, 500 acres of phragmites will be sprayed with herbicides and mowed.

During the second fiscal year (FY-10) of the proposed project, the following activities will occur:

- Monitoring spray sites to evaluate first-year spray effectiveness.
- Mowing of the dead phragmites stems.
- Monitoring of birds and vegetation.
- Conduct second-year spraying of reoccurring phragmites during summer/early fall.

During the third fiscal year (FY-11), the following activities will occur:

- Monitoring spray sites to evaluate second-year spray effectiveness.
- Mowing of the second-year dead phragmites stems.
- Monitoring of birds and vegetation.
- Conduct third-year spraying of reoccurring phragmites during summer/early fall.
- Mowing of third-year dead phragmites stems.
- Monitor birds and vegetation in spring/summer 2011 following third-year mowing.

d. Property owner agreements.

Most of the project activity (>50%) will occur on public property (DEP or other state-owned lands). Where phragmites occurs on municipal or private property, landowners will be identified (through the appropriate town assessor's office) and contacted. Letters of intent and permission for access and/or work on their property will be sent, signed by the property owner and returned to the WHAMM Program prior to any commencement of work. Additionally, the WHAMM Program will agree to be available to hold public meetings, issue press releases, conduct media interviews, contact adjacent landowners and develop an informational brochure as needed to inform interested parties of this project. Any cost for these activities would be funded from sources other than this grant.

e. Regulatory requirements.

There are no federal, state or local regulatory approvals needed to implement this project. The WHAMM Program is exempt from Connecticut pesticide application permit regulations (Connecticut General Statutes Section 22a-66z). Municipal authorities and other project partners will be kept informed and updated throughout the project implementation.

2.0 EVALUATION CRITERIA NARRATIVE

2.1 Relevance and Applicability of Project

2.1.1 Location of Project

The project area comprises a substantial portion of the wetlands in the main stem of the lower Housatonic River watershed below the Derby dam.

2.1.2 Natural Recovery Period

Because of the invasive nature of the exotic form of phragmites, in tidal brackish marshes where monotypic stands of phragmites are established and expanding, there is NO natural recovery period without human intervention. With human intervention (i.e., herbiciding and mowing as proposed) the recovery period of the marsh to a pre-phragmites condition is 3-5 years.

2.1.3 Sustainable Benefits

This proposed project will provide long-term sustainable benefits to the tidal brackish marshes, riparian areas and floodplains in the lower Housatonic River by allowing a diverse wetland community to re-establish in areas once dominated by monotypic stands of phragmites. The WHAMM Program has conducted similar phragmites control projects throughout Connecticut over the past 10 years resulting in the successful restoration of native plant and animal communities. Many of these projects have required no additional intervention. It is WHAMM's goal to maintain in perpetuity all areas where phragmites control efforts have been conducted in Connecticut. However, based on our experiences, even if no additional control was conducted after the 3-year treatment program, we expect that the overall effective period of control would be a minimum of 15 to 20 years.

To ensure sustainable benefits and long-term success of this project, the WHAMM Program will monitor treated sites and control (via spot-treatment of herbicides and mowing) areas where phragmites may be re-invading in the future as well as new phragmites-dominated sites in the project area if identified. The WHAMM Program realizes this effort requires a long-term commitment to ensure the success of this project and is prepared to fulfill this commitment.

Future land management activities should not diminish the project benefits because much of the affected area (>50%) is DEP-owned Wildlife Management Areas. Impacts to private properties should be minimized because they are wetlands, protected by state statutes and regulations.

2.1.4 Magnitude of Ecological Benefits

The non-native invasive phragmites forms dense monotypic stands in brackish and freshwater marshes, and to a lesser extent in riparian areas, floodplains and upland habitats. It displaces native vegetation resulting in decreased plant diversity and dramatically reduced use by wetland-dependent wildlife. Phragmites control projects conducted elsewhere in Connecticut have resulted in the successful restoration of diverse native communities and the re-colonization of restored sites by state-listed Endangered

and Threatened plants (Metzler, CT DEP, pers. comm.). These projects also benefit fish, invertebrates, waterfowl and other birds, including state-listed species (Brawley et al. 1998. *Environmental Management*; Benoit and Askins. 1999. *Wetlands*; Fell et al. 2006. *Northeast Naturalist*). If funded, this proposed project will restore 500 acres of primarily brackish tidal wetlands. These habitats are among the most productive and ecologically diverse habitats occurring in Connecticut with the most exemplary examples occurring within major river ecosystems such as the Housatonic River. Restoring tidal marshes degraded by phragmites enhances biodiversity and greatly benefits the entire estuarine, riverine and riparian ecosystem.

2.1.5 Magnitude of Recreational Benefits

This proposed project will enhance recreational opportunities (e.g., boating, fishing, hunting, bird watching, nature photography) of the natural resources in the area. Existing monocultures of tall (10-15 feet high), dense stands of phragmites often preclude access to marsh areas, limit visibility and are of little ecological value to wildlife. Extensive stands of dead phragmites stems in the winter can also create a significant fire and smoke hazard. Rehabilitating these areas will enhance public land and water access, restore scenic vistas, reduce the threat of marsh fires, and increase habitat quality and diversity resulting in greater use by wildlife that can be viewed by the public.

2.2 Technical Merit

2.2.1 Technical/Technological Feasibility

The DEP WHAMM Program has used its specialized low ground pressure marsh equipment employing the technique described in Section 1.2(a) (basically herbiciding and mowing) to successfully restore similar degraded habitats during the last 10 years on over 1,800 acres of wetland habitats in Connecticut. Other states (MA, NJ, RI, NY, DE, MD, NC) have conducted similar phragmites control projects with equal restoration success. The technical feasibility and methodology of this project is proven and successful.

2.2.2 Adverse Environmental Impact

Stands of phragmites do provide some level of structural nesting habitat for birds such as marsh wrens and red-winged black birds, and cover for deer. However, phragmites is not a preferred or critical habitat for these species. During the implementation of this proposed project, the phragmites will be sprayed with herbicides and the dead stems will be mowed to the ground. During this time frame, there will be a temporary loss of this structural habitat element as this cover type is gradually replaced with native vegetation. There will be no other temporary or long-term adverse environmental impacts to other wetland resources.

2.2.3 Human Health and Safety

The WHAMM Program staff that would oversee this project are all trained and certified in the application of pesticides including the herbicides that will be used for this project. New employees will also be trained and certified. All personal protective measures will be taken and OSHA guidelines will be strictly followed. The herbicides used are EPA and CT DEP registered herbicides. The EPA and DEP registration process is designed to

demonstrate that when used as directed, pesticides and herbicides will not have unreasonable adverse effects on humans or the environment. The mowed stem fragments will decompose on site and will contain no pesticide residues or other harmful agents. The implementation of this project will have NO adverse effects on human health and safety.

2.2.4 Measurable Results

To measure the success of this project on the vegetative community structure, a BACI (Before, After, Control, Impact) study design will be used. Transects (50m) will be placed throughout the project areas and pre- and post-treatment vegetative cover will be assessed using 1 square-meter quadrant sampling. The diversity and performance (density and/or cover-estimates) of marsh plants will be measured. Sampling will occur the season before herbiciding begins (pre-treatment) and during the 3 years of project implementation plus year-5 (post-treatment). GIS analysis using appropriate satellite imagery will also be considered to quantitatively assess the project impact on the vegetative community. Pre-treatment images will be compared with post-treatment time-series images (e.g., 2, 5 and 10 years post-treatment dependent on availability of imagery).

To supplement the quantitative assessment of this project, the area will have a series of fixed photographic stations to visually document pre- and post-treatment success. In addition, the project area will be flown via rotary aircraft and aerially photographed at least annually to view landscape-level impacts.

In addition to these structural parameters, bird use will be monitored as a measure of habitat function and quality. Four bird-sampling routes have been located along tidal creeks in the lower Housatonic River. Bird use will be measured by means of fixed-point call back surveys using documented sampling protocols. Additionally, bird observations along the routes will be recorded throughout the season to document bird presence in the area. While there are few studies in the literature that quantitatively assess the success of wetland restoration projects on bird populations, this study will attempt to evaluate any impact on local bird use. This assessment will supplement similar on-going work being conducted by the DEP Wildlife Division and other organizations.

Quantitative and qualitative monitoring of birds and vegetation recovery will be conducted by DEP Wildlife Division and project partners. This monitoring plan has been outlined in Table 1.2b, Project Schedule.

2.3 Project Budget

Please see Part D for detailed of the project budget and cost information.

2.3.1 Relationship of Expected Costs to Expected Benefits

Despite the substantial costs of purchasing the equipment needed to complete this project, the cost/benefit ratio of this project is still very high. For example, the WHAMM Program's existing personnel and equipment resources are committed for the next 3-years

(2007-2010) to a phragmites control project on the lower Connecticut River. This project is funded by the U. S. Department of Agriculture's Natural Resources Conservation Service (NRCS) using a standard cost-share rate for working with heavy equipment in moderately difficult wetlands at a basis of \$2,200/acre (N. Barrett, NRCS, pers.comm.). The costs for this proposed project of \$1,927/acre, are less than that standard rate.

An additional potential benefit of this project is the opportunity to use funding from this grant as "match" for other funding sources (e.g., North American Waterfowl Conservation Act [NAWCA] funds) to further wetland conservation efforts in the Housatonic River watershed. Potential projects could include phragmites control on the Housatonic River stem above the Derby dam, wetland restoration, or acquisition. It is the intent of the Wildlife Division to seek additional funding to conduct such projects in the Housatonic River watershed for the life span of the new equipment (about 10 years).

The ecological benefits of this project are very significant and the change in the landscape that will result will be dramatic. Eliminating 500 acres of primarily tidal marsh currently dominated by a monoculture of a non-native invasive phragmites will result in the restoration of natural ecological structure and functions to these habitats, the re-establishment of a diversity of native plants and dramatically enhanced use by wildlife.

Social benefits, in the form of increased public recreation, are also substantial. Boating, canoeing and kayaking opportunities will be enhanced as well as bird watching, nature photography, fishing and hunting. Scenic vistas will be enhanced for residents and visitors along the river.

This project will complement the successful on-going phragmites control program of the WHAMM Program that has been conducted for over 10 years throughout other parts of Connecticut. Restoration of degraded wetlands is recognized and strongly supported by the Long Island Sound Habitat Restoration Initiative, the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan and other similar programs. This project provides opportunities for applied research in wetland studies and other educational programs.

2.3.2 Implementation-Oriented

This project will be 100% implementation oriented. Grant funds will only be used for the equipment, personnel and materials needed to conduct phragmites control. All other project elements such as planning, design, monitoring, oversight and outreach will be funded from other sources.

2.3.3 Budget Justification and Understanding

The budget elements of this proposal are discussed in Part D.

2.3.4 Leveraging of Additional Resources

Commitments for in-kind match from Wildlife Division biologists and state funded seasonal employees have been made. Current partners include the Connecticut Audubon Society, Ducks Unlimited and the Connecticut Waterfowl Association, all of which have made in-kind contributions (see Table 2: Project Budget Summary by Task and Funding Source). Opportunities may arise to add additional conservation partners in the future.

2.4 Socioeconomic Merit

2.4.1 Community Involvement and Diversity

Members of our conservation organization project partners will be involved in science – based monitoring and interacting with private landowners in the communities where project activities will occur. In addition, this project will afford research opportunities to local universities and colleges. Several universities have conducted a variety of research projects in Connecticut at other coastal areas where we have conducted phragmites control. Other opportunities for community involvement include: river cleanups, canoe/kayak tours, and bird watching and nature photography excursions.

2.4.2 Adverse Socioeconomic Impacts

There are no adverse socioeconomic impacts associated with this project. In fact, this project will impact in a very positive way, most of the items listed as “types of impacts” in Appendix B of the RSI Instructions.

2.4.3 Coordination and Integration

This proposed project will compliment many local, regional, state, and federal conservation initiatives that have wetland restoration, enhancement of fish and wildlife habitat, and control of invasive species as a goal.

This project will directly address one of the most important threats to conservation identified in the recently completed Connecticut *Comprehensive Wildlife Conservation Strategy* (CWCS). This CWCS is a product of the most intensive wildlife conservation planning effort ever conducted in Connecticut and will guide conservation efforts for the next decade. A key threat to wildlife diversity identified in the CWCS that this project will address is: Degradation of habitats by non-native invasive species.

In addition to addressing one of the major threats identified in the CWCS, this project is complimentary to the goals and recommendations of many plans including:

- Update to the Town Plan (Stratford) of Conservation and Development (2003).
- City of Milford Connecticut Plan of Conservation and Development (2002).
- CT Office of Policy and Management Plan of Conservation and Development.
- Atlantic Coast Joint Venture (the lower Housatonic River has been identified as a Focus Area of the ACJV).
- North Atlantic Regional Shorebird Plan.
- Connecticut Invasive Plant Working Group.

2.4.4 Public Outreach

The WHAMM Program currently has brochures and other educational materials available to the public on Phragmites control and wetland restoration. However, because the majority of the public is not aware of the positive environmental benefits of phragmites control and because there is likely a segment of the public in the lower Housatonic River area that may perceive phragmites as “natural marsh vegetation,” we will develop an informational brochure specific to this project. This brochure will be developed and printed using other funding sources, and disseminated to municipalities, local conservation groups and the general public. Additionally, the DEP would send out a press release at the initiation of this project and at “milestone” events (e.g., completing a project at a specific marsh) and be available for town meetings and media interviews. Also, signs will be posted wherever the WHAMM Program is actively working explaining the project and its ecological benefits. Finally, upon completion of this project, signs will be developed acknowledging all project partners and identifying the Housatonic River Basin Natural Resources Restoration Project as the primary funding source. These signs will be placed at appropriate locations throughout the lower Housatonic River where the public could view them.

2.5 Applicant Implementation Capacity

2.5.1 Technical Capacity of Applicant and Project Team

The WHAMM Program’s staff is well qualified and experienced in wetland restoration and phragmites control. The WHAMM Program has been conducting wetland management and restoration activities in Connecticut since 1986. More specifically, the WHAMM Program has performed phragmites control projects using the methods described herein for over 10 years resulting in the successful restoration of approximately 1,800 acres of similarly degraded coastal and freshwater wetlands. All supervisors and staff members are certified (by CT DEP Pesticide Program) to apply herbicides to control phragmites. The new employees funded by this proposal will also be certified prior to project implementation. The WHAMM Program Supervisor and Environmental Analyst have degrees in wildlife management and over 20 years experience each in wetland management. The existing WHAMM field crew consists of individuals that are certified mechanics and/or certified welders, and several have over 20 years experience in operating and maintaining excavation equipment and low ground pressure machinery.

Examples of projects similar in scope and nature to this proposed project are listed below:

- *Lynde Point Marsh Restoration.* Old Saybrook. Completed in 2005. Cost: \$221,000. This project restored and enhanced 10 acres of degraded brackish tidal wetlands through phragmites control and dredge spoil excavation. This project was funded in part by a NOAA Coastal Wetland grant awarded to the DEP Wildlife Division. Partners included: U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Corporate Wetland Program, Lynde Point Land Trust, Borough of Fenwick and private landowners.

- *Lord's Cove Marsh Restoration*. Lyme. Completed in 2004. Cost: \$255,508. This project restored 200 acres of degraded wetlands through phragmites control. Partners included: The Nature Conservancy, Natural Resources Conservation Service, U.S. Fish and Wildlife Service.
- *Lower Connecticut River Wetland Restoration: Great Island Complex*. Old Lyme. Completed in 2002. Cost: \$667,207. This project restored and enhanced 300 acres of degraded wetlands through phragmites control and pond/panne construction. This project was funded in part by a NAWCA grant awarded to the DEP Wildlife Division. Partners included: U.S. Fish and Wildlife Service, Ducks Unlimited, Valley Shore Waterfowlers, The Nature Conservancy, and the Connecticut Waterfowl Association.
- *East River Marsh Restoration*. Guilford. Completed in 1999. Costs: \$109,964. This project restored and enhanced 150 acres of degraded wetlands through ditch plugging and pond/panne construction. Partners included: DEP Office of Long Island Sound Programs and U.S. Fish and Wildlife Service.

2.5.2 Administrative Capacity of Applicant and Project Team

The applicant and the two WHAMM Program employees (supervised by the applicant) who will oversee this project have a combined total of over 60 years experience in administering projects of this type. They have access to a wide variety of professional colleagues within DEP, at universities and state and federal biologists that can provide specific expertise, if needed to assist this project. The applicant is a Certified Wildlife Biologist with over 30 years of working experience in the natural resources field, including the last 17 years working primarily as an administrator. In those 17 years the majority of the applicant's duties and responsibilities has been the administration of wildlife conservation projects funded by federal grants (e.g., the Federal Aid in Wildlife Restoration Program, State Wildlife Grant Program).

The WHAMM Program's staff is administratively capable of seeing this project through completion. Since the WHAMM Program has been in the DEP (1993), its primary source of funds has been from grants. Thus, the WHAMM Program Supervisor has substantial experience in successfully carrying out both the physical work and the administrative requirements (e.g., budgeting, preparing reports, etc.) of completing grant funded projects. He and the staff Environmental Analyst are members of the Connecticut Tidal Wetlands Steering Committee that oversees state wetland restoration projects. The staff frequently coordinates similar projects with state and federal regulatory agencies, other governmental and non-governmental agencies, academic institutions and private enterprises to solicit technical input, form project partnerships and to leverage project funds.

2.5.3 Project Commitments

Receipt of this grant will allow the DEP's WHAMM Program to greatly expand and accelerate its phragmites control efforts. Restoration of degraded wetlands is the WHAMM Program's top priority. The DEP's non-governmental conservation partners,

three of whom are involved in this project, recognize the negative impacts of monocultures of phragmites and strongly support expansion of our control efforts (see attached "Partner" letters of commitment). All the DEP personnel needed to oversee this work are in place and committed to the project. The DEP's Fiscal Management Division is aware of this grant application and prepared to administer the funds it. No additional DEP authorizations are needed to initiate work on this grant. Commitment letters from our current partners are attached.

Part D- Budget Narrative

PROJECT EXPENSES FUNDED BY HOUSATONIC RIVER NRD FUNDS

Salaries and Benefits

Due to the size, scope and duration of the proposed project, the DEP WHAMM Program would hire two durational Environmental Protection Maintainer 1 positions (Class code 3487) (Pay Plan PS-02) for the 3-year duration of this project. Their duties would be to conduct the herbiciding and mowing and to maintain the equipment. The costs of salary and fringe are:

Year 1 = $2 \times \$14.95 \times 40 \text{ hrs/wk} \times 52 \text{ wks} = \$62,192$

Year 2 = $2 \times \$15.85 \times 40 \text{ hrs/wk} \times 52 \text{ wks} = \$65,939$

Year 3 = $2 \times \$16.80 \times 40 \text{ hrs/wk} \times 52 \text{ wks} = \$69,888$

Subtotal (salary) = \$198,019.00

Note that salary figures are increased by 6% for years 2 and 3 to account for annual salary increases for state employees and cost of living allowances.

Fringe rate of 60% per year*

60% of Year 1 \$62,192 = \$37,314

60% x Year 2 \$65,939 = \$39,563

60% of Year 3 \$69,888 = \$41,933

Subtotal (fringe) = \$118,810.00

Total durational employee cost = \$316,829.00

For maximum effectiveness the herbicides need to be applied during the latter half of the growing season. Due to the large acreage of the project and the relatively short spray-window opportunity for herbiciding the WHAMM Program would also need to hire:

Four seasonal positions ($4 \times \$11 \times 40 \text{ hrs/wk} \times 26 \text{ wks}$) for Year 1 = \$45,760

Four seasonal positions ($4 \times \$12 \times 40 \text{ hrs/wk} \times 26 \text{ wks}$) for Year 2 = \$49,920

Because of the anticipated level of phragmites control after 2 years, the remainder of the area needing treatment should be able to be completed by the 2 durational employees.

Therefore, no seasonal employees will be required for Year 3 of this project.

Subtotal (salary) of \$95,680.00

Fringe rate of 42% per year*

Subtotal (fringe) of $42\% \times \$95,680 = \$40,186.00$

Total seasonal employee cost = \$135,866.00

[* State of Connecticut standard fringe rates for durational and seasonal staff]

TOTAL EMPLOYEE COST = \$452,695.00

Part D, Project Narrative, Discussion (cont.)

Equipment and Materials Costs:

1) **Equipment:** To perform the necessary activities of this project, the WHAMM Program would need to purchase the following items:

- Three (3) Land Tamer II® Industrial RAV 8x8 lgp vehicles with sprayer unit (\$67,461 each): subtotal = \$202,338.00
- Three (3) 5' deck mowers for Land Tamers: subtotal = \$15,000.00
- One (1) amphibious MarshMaster II® with sprayer & mower: subtotal = \$125,000.00
- Rental of water truck, fuel, other miscellaneous (maintenance and repair) items: subtotal = \$64,082

Total equipment cost = \$406,465.00

2) **Materials:** The costs of the herbicides and surfactants needed to conduct this 3-year project are as follows:

- Due to the density and dominance of Phragmites cover, the herbicide Habitat® (active ingredient Imazapyr, EPA reg. #241-426) will be used to achieve maximum control in the first year. Habitat costs \$638.00 per 2.5 gallon container. Application rate of 0.75 gal. per acre x 500 acres = 375 gallons. Each container = 2.5 gal. Therefore, 375 gal/2.5 gal. container = 150 containers x \$638.00 per container = **subtotal for Habitat: \$95,700.00**
- Significant (80-90%) control of Phragmites is anticipated in the first year. Second and 3rd year treatments will be conducted using different herbicides that are considerably less expensive than Habitat. Second and 3rd year treatment using the herbicides: a) AquaNeat® (active ingredient, glyphosate, EPA #228-365) costs \$74.50 per 2.5 gallon container. Application rate of 0.75 gal. per acre x 50 acres = 37.5 gallons. Each container = 2.5 gal. Therefore, 37.5 gal/2.5 gal. container = 15 containers x \$74.50 per container = **subtotal for AquaNeat: \$1118.00** and b) Renovate 3® (a.i. triclopyr, EPA reg. #62719-37-67690) costs \$348.00 per 2.5 gallon container. Application rate of 0.75 gallons per acre x 50 acres = 37.5 gallons. Each container = 2.5 gal. Therefore, 37.5 gal/ 2.5 gal. container = 15 containers x \$348.00 per container = **subtotal for Renovate = \$5220.00**
- A non-ionic surfactant will be needed for all three years' applications. Chemsurf 90® costs \$14.10 per gallon container. This is mixed in the spray tank at a rate of 0.5 gal/100 gal tank mix. It is expected that 30,000 gallons of herbicide mix will be needed for the 3-year period. Therefore, 150 gallons of Chemsurf is needed; 150 gal x \$14.10/gal = **subtotal for Chemsurf = \$2115.00.**

Total material cost = \$104,153.00

TOTAL EMPLOYEE, EQUIPMENT AND MATERIAL COST = \$963,313.00

Part D, Project Narrative, Discussion (cont.)

OTHER CONTRIBUTIONS

This section corresponds to Table 2. Project Budget Summary by Task and Funding Source. The tasks (Table 2, column 1) necessary to implement the proposed project are as follows:

Task A: Mapping and monitoring. The locations of phragmites monocultures occurring in the lower Housatonic River watershed will be identified through examination of aerial photos, satellite imagery and site inspections. This cost will be incurred by the DEP WHAMM Program and will be considered as in-kind match. In addition to WHAMM Program commitment, a large portion of the monitoring of vegetation and birds will be conducted by project partners. These costs are considered as committed matching funds.

Task B: Property owner permissions. A significant portion (>50%) of the project area is on public property (DEP or other state-owned lands). However, where phragmites occurs on private property, landowners will be identified through town assessors' offices and letters of permission for access will be obtained. This task will be performed by project partners and DEP WHAMM staff. Initial contact of private landowners will be by members of our project Partner organizations who live in or near the towns where the work will occur. Time spent by Partners working on this task is considered as committed matching funds.

Task C: Equipment and herbicides would be purchased and personnel hired. Bid solicitation, purchasing equipment and herbicides, and interviewing prospective durational and seasonal employees will be conducted by WHAMM Program staff. This cost will be incurred by the DEP WHAMM Program and will be considered as in-kind matching funds.

Task D: Phragmites would be herbicided and mowed annually for a three-year period. The supervision and administration requirements of a project of this magnitude are substantial and will require a significant portion of the time budget of the WHAMM Program's Supervisor and Environmental Analyst. The value of this time will be considered as in-kind matching funds.

Explanation of DEP in-kind costs

Dollar values listed in Table 2, Column 2 (A-D) were derived based on the WHAMM Program Supervisor contributing 75 days per year and the WHAMM Environmental Analyst contributing 64 days per year over the 3-year project, a total of 417 person-days. Values were calculated as follows:

WHAMM Program Supervisor – 75 days/year x 3 years x \$320/day = \$72,000.

WHAMM Program Environmental Analyst – 64 days/year x 3 years x \$250/day = \$48,000.

Total base salary costs = \$120,000 plus 43% fringe (\$51,600) and 23% indirect (\$27,600) equals a Grand Total for in-kind costs of \$199,200.

The 417 person-days that the WHAMM Program Supervisor and Environmental Analyst have committed to this project will be used as follows:

Task A (Mapping and Monitoring) – 20% of WHAMM Supervisor/EA time is 83.4 days = \$39,840.

Task B (Property Owner Permissions) – 20% of WHAMM Supervisor/EA time is 83.4 days = \$39,840.

Task C (Purchases and Personnel) – 10% of WHAMM Supervisor/EA time is 41.7 days = \$19,920.

Task D (Supervision and Administration) – 50% of WHAMM Supervisor/EA is 208.5 days = \$99,600.

The staff time allotted for these tasks was estimated based on our experiences conducting similar projects.

Committed Contributions

The three current project partners have each agreed to contribute 100-person hours for a total of 300 hours of in-kind time towards vegetation assessment, bird surveys and working with landowners to obtain permission to work on private property. We used an hourly rate of \$22.02/hour (the starting hourly pay rate for a DEP Wildlife Technician) to calculate the value of this in-kind time (\$6,606). Valuation of in-kind time of volunteers conducting duties similar to basic technician duties is a standard practice for federal aid projects (T. Petrillo, DEP Federal Aid Coordinator).

We estimated that 67% of partner time would be spent on monitoring vegetation and birds (Task A) and 33% working with private property owners (Task B) (Table 2).

Contingencies

Progress on wetland restoration projects can be impacted by inclement weather, breakdowns of equipment and a multitude of other reasons. However, the WHAMM Program has many years of experience in successfully dealing with these issues and potential interruptions in work-flow were considered during the design and development of this proposal.

If there are unforeseen additional costs associated with this project, The Wildlife Division's WHAMM Program is prepared to meet these costs using funds from other sources; either Program funds, additional grant funds or from financial contributions from additional project partners.

Part D - TABLE 1. HOUSATONIC RIVER NRD FUNDING ALLOCATION BY FISCAL YEARS ¹

PROJECT TITLE:	Habitat Restoration on the Housatonic River Through The Control of the Non-Native Invasive Plant, Phragmites								
SPONSOR NAME:	The Connecticut Department of Environmental Protection								
EXPENSE CATEGORY (See App. A)	FISCAL YEAR 1		FISCAL YEAR 2		FISCAL YEAR 3		FISCAL YEAR 4		
	Housatonic River NRD Funds		Housatonic River NRD Funds		Housatonic River NRD Funds		Housatonic River NRD Funds		
A. SALARIES	\$107,952.00		\$115,859.00		\$69,888.00				
B. OVERHEAD AND BENEFITS	\$57,407.00		\$59,656.00		\$41,933.00				
C. CONTRACTED SERVICES									
D. SUPPLIES, MATERIALS AND EQUIPMENT	\$510,618.00								
E. TRAVEL									
F. OTHER (LIST)									
G. OTHER (LIST)									
TOTAL BY FISCAL YEAR	1	\$675,977.00	2	\$175,515.00	3	\$111,821.00	4		
GRAND TOTAL (sum of boxes 1+2+3+4) [This sum is the total NRD fund request and should match Part A, Budget Summary, Box 1]								\$963,313.00	

¹ The fiscal year is July 1 – June 30. If the proposed project will be completed in one year, fill in only the column titled "Fiscal Year 1."

Part D - TABLE 2. PROJECT BUDGET SUMMARY BY TASK AND FUNDING SOURCE

PROJECT TITLE:	Habitat Restoration on the Housatonic River Through The Control of the Non-Native Invasive Plant, Phragmites						
SPONSOR NAME:	The Connecticut Department of Environmental Protection						
TASK ²	HOUSATONIC RIVER NRD FUNDS	OTHER CONTRIBUTIONS		TOTAL COST BY TASK			
		COMMITTED	NOT COMMITTED				
A.		\$39,840 DEP in-kind \$4,404 Partners				\$44,244	
B.		\$39,840 DEP in-kind \$2,202 Partners				\$42,042	
C.		\$19,920 DEP in-kind				\$19,920	
D.	\$963,313	\$99,600 DEP in-kind				\$1,062,913	
E.							
F.							
G.							
TOTAL BY FUNDING SOURCE	5	\$963,313	6	\$205,806	7	8 GRAND TOTAL \$1,169,119.00	

NOTES: Box 5 should be the same as the Grand Total indicated in Part D Table 1. Box 6 above should match Part A, Budget Summary, Box 2. Box 7 above should match Part A, Budget Summary, Box 3. Box 8 should match Part A, Budget Summary, Box 4

² The listed tasks should correspond with information provided in Part D, Budget Narrative and Project Implementation Plan.



Connecticut
Audubon Society

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Michael J. Powers
CT DEP – Inland Fisheries Division
Housatonic River Natural Resources Restoration Project
79 Elm Street
Hartford, Ct 06106-5127

June 7, 2007

Dear Mr. Powers:

This letter is in support of the Connecticut Department of Environmental Protection Wildlife Division's wetland habitat restoration project entitled: *Wetland habitat restoration on the Housatonic River through the control of the non-native invasive plant phragmites (Phragmites australis var. americanus)*.

In addition, the Connecticut Audubon Society is pleased to be a partner in this effort and, if approved, will commit 100 hours of in-kind effort from Connecticut Audubon Society staff and volunteers to conduct bird and vegetation monitoring, as well as assist in obtaining permission from private landowners to allow control efforts on their properties. CAS will also assist in public outreach and communications.

The Connecticut Audubon Society has a long history (over 30 years) of active partnership with the Connecticut Department of Environmental Protection and the rewards of this partnership are evident in the continuing improvement of the state's natural resources. Our collective efforts with similar phragmites control projects in Connecticut have resulted in the dramatic increase in wildlife use that occurs following the treatment of these habitats.

We are especially proud of this partnership and the opportunity to work with a group of dedicated professionals at DEP.

We urge the Natural Resources Trustee SubCouncil for Connecticut to approve this grant proposal submitted by the DEP Wildlife Division. The opportunity to restore 500 acres of wetlands within the lower Housatonic River will not be soon repeated. The restoration of these tidal wetlands and habitats will help recover some of the most productive and ecologically diverse habitats in Connecticut.

Thank you for your consideration.

Sincerely,

Milan G. Bull
Senior Director of Science and Conservation

JUN 12 2007

Connecticut*Waterfowl Association*

June 12, 2007

Michael J. Powers
CT DEP – Inland Fisheries Division
Housatonic River Natural Resources Restoration Project
79 Elm Street
Hartford, Ct 06106-5127

Dear Mr. Powers:

The Connecticut Waterfowl Association (CWA) is pleased to be a "Partner" with the Connecticut Department of Environmental Protection, Wildlife Division on the wetland habitat restoration project entitled, *Wetland habitat restoration on the Housatonic River through the control of the non-native invasive plant Phragmites* (*Phragmites australis* var. *americanus*).

It is our hope that the Natural Resources Trustee Sub Council for Connecticut will approve this grant proposal submitted by the DEP Wildlife Division to restore 500 acres of wetlands within the lower Housatonic River. This project will restore primarily tidal wetlands, habitats that are among the most productive and ecologically diverse habitats in Connecticut. We have worked with the Wildlife Division on similar *Phragmites* control projects in Connecticut and witnessed the dramatic increase in wildlife use that occurs following the treatment of these habitats.

If this grant is approved, CWA will commit 100 hours of in-kind time from CWA volunteers to assist the Wildlife Division with:

- Bird and vegetation monitoring.
- Obtaining permission from private landowners to allow control efforts on their properties.
- Public outreach and communications.

Sincerely,

David Proulx
President

CWA
P.O. Box 74
Bozrah, CT 06334-0074
www.ctwaterfowlers.org

June 18, 2007

Michael J. Powers
CT DEP – Inland Fisheries Division
Housatonic River Natural Resources Restoration Project
79 Elm Street
Hartford, Ct 06106-5127

Dear Mr. Powers:

Ducks Unlimited, Inc. (DU) is pleased to be a "Partner" with the Connecticut Department of Environmental Protection, Wildlife Division on the wetland habitat restoration project entitled, *Wetland Habitat Restoration on the Housatonic River Through the Control of the Non-native invasive Plant Phragmites* (Phragmites australis var. americanus).

It is our hope that the Natural Resources Trustee SubCouncil for Connecticut will approve this grant proposal submitted by the DEP Wildlife Division to restore 500 acres of wetlands within the lower Housatonic River. This project will restore primarily tidal wetlands, habitats that are among the most productive and ecologically diverse habitats in Connecticut. We have worked with the Wildlife Division on similar phragmites control projects in Connecticut, and have witnessed the dramatic increase in wildlife use that occurs following the treatment of these habitats.

If this grant is approved, DU will commit 100 hours of in-kind time to assist the Wildlife Division with:

- Bird and vegetation monitoring.
- Obtaining permission from private landowners to allow control efforts on their properties.
- Public outreach and communications.

Sincerely,

Robert D. Hoffman
Director

CC: Craig Ferris