Draft Amendment

to the

Housatonic River Basin Final Natural Resources Restoration Plan, Environmental Assessment, and Environmental Impact Evaluation for Connecticut

January 2013

State of Connecticut, Department of Energy and Environmental Protection

United States Fish and Wildlife Service

National Oceanic and Atmospheric Administration

Contents

1.0 INTRODUCTION 3
2.0 ALTERNATIVES ANALYSIS 6
2.1 No Action Alternative 6
2.2 Proposed Preferred Alternative 6
2.2.1 Power Line Marsh Restoration 6
2.2.2 Long Beach West Tidal Marsh Restoration 9
2.2.3 Pin Shop Pond Dam Removal 11
2.2.4 Old Papermill Pond Dam Removal Feasibility Study 14
2.2.5 Housatonic Watershed Habitat Continuity in Northwest Connecticut 17
2.2.6 Tingue Dam Fish Passage 19
2.2.7 McKinney NWR, Great Meadows Unit Marsh Restoration 22
2.3 Alternatives Considered But Not Recommended For Funding 25
2.3.1 Leete's Island 25
2.3.2 Heminway Pond – Steele Brook Pond Dam Removal 27
2.3.3 Eel Project 29
3.0 POTENTIAL IMPACTS OF ALTERNATIVES 31
3.1 Power Line Marsh Restoration 34
3.2 Long Beach West Restoration 34
3.3 Pin Shop Dam Removal 35
3.4 Old Papermill Pond Dam Removal Feasibility Study 35
3.5 Housatonic Watershed Habitat Continuity in NW CT 36
3.6 Tingue Dam Fish Passage 36
3.7 McKinney NWR, Great Meadows Unit Marsh Restoration 36
3.8 Cumulative Impacts of the Preferred Alternative 37
4.0 DOCUMENT PREPARERS 37
5.0 AGENCIES, ORGANIZATIONS, AND PARTIES CONSULTED FOR INFORMATION 38
6.0 APPENDIX A. Trustee Approvals 39

1.0 INTRODUCTION

This document serves as the Draft Amendment to the July, 2009 *Housatonic River Basin Final Natural Resources Restoration Plan, Environmental Assessment, and Environmental Impact Evaluation for Connecticut* (the Restoration Plan). The Draft Amendment was prepared by the Natural Resource Trustees responsible for implementing restoration for the Housatonic-CT GE Natural Resource Damage Assessment (U.S. Fish and Wildlife Service (FWS) of the Department of the Interior, the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce, and the State of Connecticut, acting by and through its Department of Energy and Environmental Protection (CT DEEP)). Introductory and background material, including the affected environment and project eligibility and evaluation criteria are described in detail in the Restoration Plan (Sections 1, 2, 3 and 6), and are herein incorporated by reference.

The goal of the Restoration Plan and the Draft Amendment is to utilize natural resource damages ($7.75 million) to restore injured natural resources and services resulting from the release of hazardous substances, primarily polychlorinated biphenyls (PCBs), from the GE facility in Pittsfield, Massachusetts. Natural resources that were impacted include aquatic organisms and their habitats in the Housatonic River basin, as well as birds, reptiles and mammals that consume aquatic organisms. Natural resource services that were impacted include recreational fishing and boating. Restoration efforts are intended to restore, rehabilitate, replace, or acquire the equivalent of the natural resources and services injured or lost due to the release.

Under the Restoration Plan, the Trustees distributed funds to three categories of projects: Aquatic Natural Resources ($1.7 million), Riparian and Floodplain Natural Resources ($2.8 million) and Recreational Uses of Natural Resources ($2.6 million). Since the funds allocated to projects in the Aquatic Natural Resources category was substantially less than funds allocated to the other resource categories, the Trustees chose to reserve remaining funds for subsequent awards to Aquatic Natural Resource projects. At this time, all of the projects identified in the Restoration Plan have been funded, with the exception of one of the originally selected aquatic projects (Blackberry River Fish Passage Restoration), which was determined to be infeasible. The total amount of funds remaining for additional restoration is currently $2,423,328 (this amount reflects a significant amount of interest earned on the original settlement).

The CT SubCouncil proposes to modify the Restoration Plan by way of this Draft Amendment to use the majority of the remaining funds to implement additional aquatic natural resources projects. Other remaining funds will be reserved for contingencies, oversight, and possibly future project implementation. By implementing the currently selected projects, the Trustees seek to increase the restoration of injured aquatic natural resources and more fully compensate the public for the full suite of injuries to the environment resulting from the release of hazardous substances from the GE facility in Pittsfield, Massachusetts, thereby fulfilling the goals of the original Restoration Plan.

The Trustees have identified seven preferred alternative aquatic restoration projects (Table 1; Figure 1) and three non-preferred alternatives. A “No Action” alternative, required by NEPA and CERCLA provisions, is included to examine the expected condition if additional Trustee-funded

aquatic restoration activities under the NRD settlement with GE are not pursued. The No Action alternative is the baseline against which other actions can be compared.

Table 1. Preferred alternative aquatic restoration projects.

Proposed Project		Town	Cost
1. Power Line Marsh Restoration	Housatonic River	Milford	$ 55,000
2. Long Beach West Restoration	Coastline	Stratford	$ 40,000
3. Pin Shop Dam Removal	Naugatuck River	Watertown	$ 700,000
4. Old Papermill Pond Dam Removal	East Aspetuck River	New Milford	$ 100,000
5. Housatonic Watershed Habitat Continuity	Housatonic River	Multiple	$ 150,000
6. Tingue Dam Fish Passage	Naugatuck River	Seymour	$ 672,000
7. McKinney NWR, Great Meadows Unit	Coastline	Stratford	$ 300,000
		Total:	$2,017,000

The Trustees invite the public to submit additional Aquatic Natural Resources project proposals and written comments on the Draft Amendment. Comments, suggestions or additional alternatives should be as detailed and as specific as possible. Project proposals and written comments should be sent to: Robin Adamcewicz, CT DEEP Eastern District Headquarters, 209 Hebron Road, Marlborough, CT 06447. The public will have 30 days to comment on the Draft Amendment. After the comment period, the Trustees will review and consider all comments prior to issuing a Final Amendment. Summaries of all comments received by the Trustees, responses to comments, as well as any clarifications or revisions will appear in the Final Amendment.

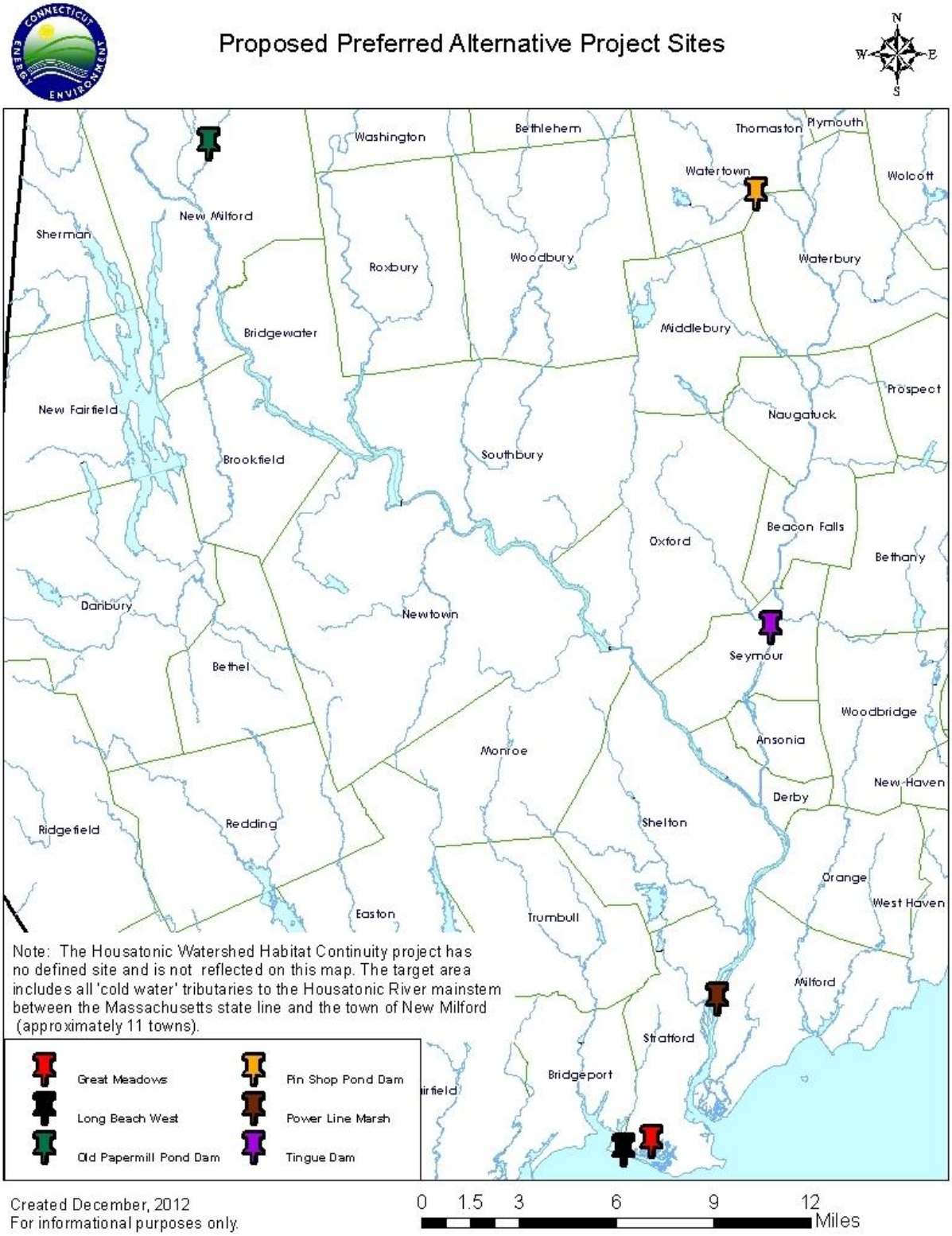

Figure 1. Proposed Preferred Alternative Project Locations

2.0 ALTERNATIVES ANALYSIS

2.1 No Action Alternative

Under the No Action alternative, no additional aquatic restoration projects would be implemented with funds from the Housatonic River NRD settlement with GE. The result would be to forego ecological benefits associated with restored aquatic resources as well as economic and educational benefits associated with further restoration.

Under the No Action scenario, the Housatonic River watershed would continue to be influenced by a variety of ongoing ecological stressors, including development, industrial point source discharges, agricultural nonpoint source discharges, and other factors. The absence of additional Trustee-funded restoration activity under the No Action alternative therefore implies lower environmental quality within the region than if restoration projects were implemented. Some of the natural resources and services impacted by the releases of PCBs may recover naturally. However, this recovery would be slow and may fall short of conditions achieved through active restoration efforts.

In contrast, the recovery of impacted natural resources and services could be expedited with the implementation of restoration projects.

Although the No Action alternative provides a useful reference point for characterizing the impact of the other restoration alternatives, it fails to fulfill the Trustees' mandate under CERCLA and is contrary to the terms of the settlement agreement that was approved by the court. The damage assessment regulations state that "monies that constitute the damage claim amount shall be paid out of the account…only for those actions described in the Restoration Plan…" (43 CFR 11.92(c)). Hence, the CT SubCouncil is obligated to pursue a restoration program under the terms of the settlement agreement.

2.2 Proposed Preferred Alternative

2.2.1 Power Line Marsh Restoration

CT DEEP Wetlands Habitat and Mosquito Management Unit
Requested NRD Funds: $30,000
Other Contributions: $30,000
NRD Allocation: $55,000

Project Description

The focus of the project is to create six large pools and interconnected channels to enhance the wetland habitat of the 50-acre Power Line Marsh in Milford, Connecticut (Figure 2). The goal is to restore the marsh to a more natural configuration than the current grid of ditches which remain from historic efforts to drain the marsh for mosquito control. Pools and channels will increase habitat diversity across the marsh and lead to an increase in invertebrate, fish (primarily *Fundulus* spp.), and bird use of the marsh. A natural form of mosquito control whereby *Fundulus* will prey upon mosquito larvae is also expected. Additionally, there will likely be a decrease in

nonpoint source pollution, as the enhanced wetland will provide water quality benefits such as increased interception of runoff and transforming/storing non-point source pollutants. In addition to pool creation, the dominant vegetation, nonnative invasive common reed (*Phragmites australis)*, will be controlled under the auspices of a project previously awarded funding in the Restoration Plan (P-33 *Wetland Restoration on the Lower Housatonic River*).

Site Description

The project is located in a 50-acre tidal wetland along the east side of the Housatonic River in Milford, Connecticut, with several state and private owners. The marsh is connected to the Housatonic River by a man-made tidal channel; this tidal creek is effectively the primary channel of a remnant grid pattern of mosquito ditches. The entire 50 acres is dominated by common reed, and is related to urbanization and increased levels of storm runoff collecting in the marsh.

Figure 2. Power Line Marsh. Milford, CT.

Project Evaluation Summary

Relevance and Applicability

The constructed pools and tidal channels will result in an increase in wildlife use of the marsh, a natural form of mosquito control, and nonpoint source pollution abatement. This will further enhance the expected benefits from the existing common reed control project that is to be implemented in this area. Implemented together, the two projects will result in greater benefits to fish and wildlife that utilize the area. The CT DEEP will quantitatively monitor changes in vegetation and bird use before and after project implementation.

Technical Merit

The CT DEEP is recognized as a national leader in the field of tidal marsh restoration. There is a high likelihood the project will enhance Power Line Marsh. Several marsh functions are likely to be improved, including habitat for wildlife, upland buffering capacity during coastal storms, and nonpoint source pollution abatement. Few adverse impacts are expected. Precautions will need to be undertaken to protect populations of state-listed salt marsh bulrush and to minimize temporary impacts to the marsh from the creation of the pools.

Project Budget

The cost to create pools and tidal creeks is estimated to be $30,000. The CT Sub Council has allocated an additional $25,000 to ensure that common reed eradication at the site is successful. These funds will support several additional years of monitoring and follow up treatment of residual common reed.

Socioeconomic Merit

Project partners include Ducks Unlimited, the City of Milford, and the Connecticut Waterfowlers Association. The project complements Connecticut's tidal wetland regulatory program which protects, conserves, and restores tidal wetlands through the Connecticut Coastal Management Act. The project will not generate adverse socioeconomic impacts.

Applicant Implementation Capacity

The project team is qualified and has necessary technical and administrative experience for implementing this project. Project commitments other than NRD funding have been secured.

Summary of Findings

The project will enhance a 50-acre tidal marsh adjacent to the Housatonic River. Overall, the project will provide numerous benefits to aquatic natural resources at reasonable cost to the CT SubCouncil. Considering the merits of the proposal, the CT SubCouncil allocated $55,000 for this project. Project plans to be approved in advance by the Trustees, must include precautions for state listed species known to occur in the area, including salt marsh bulrush.

2.2.2 Long Beach West Tidal Marsh Restoration

CT DEEP Wetlands Habitat and Mosquito Management Unit
Requested NRD Funds: $20,000
Other Contributions: $1,200
NRD Allocation: $40,000

Project Description

This project will enhance previously implemented restoration efforts at Long Beach West (Figure 3) by eradicating nonnative common reed and excavating marsh surfaces to elevations that will support native salt marsh vegetation, including *Spartina alterniflora*, *S. patens*, *Distichlis spicata*, and *Iva frutescens*. Additionally, large debris (e.g. plywood, lumber) that has been deposited at the site by the tide will be removed to prevent further marsh degradation caused by shading and smothering.

Site Description

Long Beach West is a 35-acre undeveloped coastal barrier beach owned primarily by the Town of Stratford, Connecticut. The project site is situated near Great Meadows, a 750-acre tidal marsh system, including the open water of Lewis Gut and the marshes on both its barrier beach side and mainland side. In 2010 and 2011, a large-scale dune restoration project was undertaken on Long Beach West and included the demolition of all existing cottages and associated structures. The project was funded through the CT DEEP, the National Fish and Wildlife Foundation, and the FWS. Following the completion of the restoration effort, several areas of invasive plants still remain on the tidal marshes adjacent to the barrier beach.

Project Budget

This project will, for very little cost, augment large-scale dune restoration efforts that have already been conducted. Common reed control will take place annually for three years in stands scattered throughout an 8-acre area. The marsh surface will be excavated, as needed, to increase tidal inundation and encourage growth of native salt marsh plants. While construction plans have not yet been drafted, the CT DEEP Wetlands Habitat and Mosquito Management Program, which will be implementing the project, is experienced in this type of work, and the budget is comparable to similar salt marsh restoration efforts of this scale.

Socioeconomic Merit

This site is open to the public, and the local community has organized clean-ups of the area on a regular basis, including several after the cottage removal was completed. The Town of Stratford has agreed to supply a dumpster and waive the associated disposal fees. No negative socioeconomic impacts are expected.

Applicant Implementation Capacity

Having successfully implemented common reed control and dune restoration projects for many years, the CT DEEP Wetlands Habitat and Mosquito Management Unit is qualified and has the necessary technical and administrative experience for implementing this project.

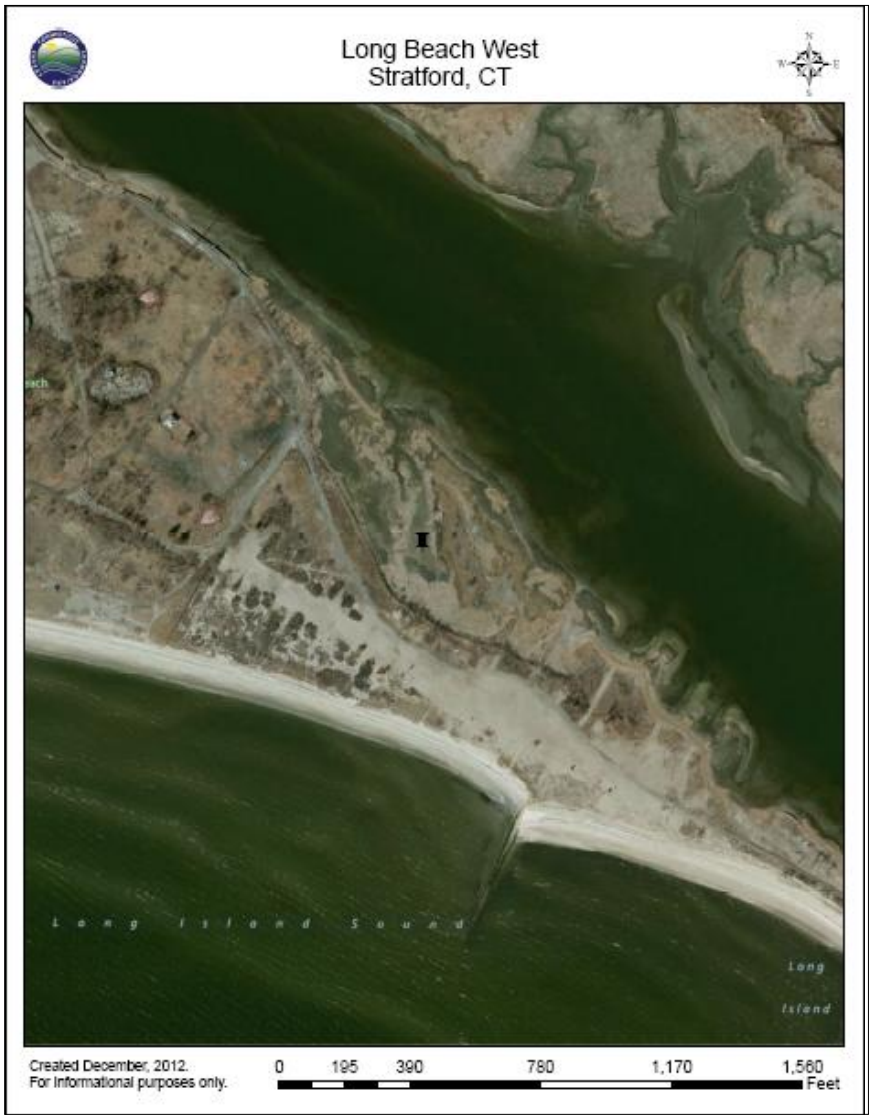

Figure 3. Long Beach West. Stratford, CT.

Summary of Findings

Given the significant level of effort and funding already expended to restore this barrier beach and the relatively low cost of the proposed salt marsh restoration project, the CT SubCouncil has allocated the requested $20,000, plus an additional $20,000 to fund a total of five years of common reed control. Project plans to be approved in advance by the Trustees, must include

precautions for state and federally listed species known to occur in the area, including piping plover, least tern, beach needle grass and seabeach sandwort.

2.2.3 Pin Shop Pond Dam Removal

The Old Pin Shop, LLC
Requested NRD Funds: $700,000
Other Contributions: $600,000
NRD Allocation: $700,000

Project Description

The project proposes to remove the Pin Shop Pond dam (Figure 4). The project will eliminate the potential hazard of a failure, and uncontrolled release of contaminated sediment. It will also open Steele Brook and Wattles Brook for diadromous fish passage, and result in restoring a portion of Steele Brook from a shallow, sediment-filled pond to a flowing river channel. The project includes removing the stone masonry spillway and the downstream concrete apron, removing approximately 15,000 cubic yards of sediment from the pond, and construction of a riprapped channel with fish weirs to allow passage. The exact configuration of the weirs can be adjusted to maximize the passage of diadromous fish. The project will also remove a 4-foot-high steel sheet-pile weir located about 0.4 mile upstream from the confluence of Steele Brook and the Naugatuck River and 1.8 miles downstream of the dam. This weir is located on property not owned by the Old Pin Shop LLC, however, the current property owners have agreed to allow it to be removed under the auspices of this project. Invasive species growing on islands in the pond will be removed and native species, as appropriate, will be transplanted to the exposed areas of the old pond bottom.

Site Description

The Pin Shop Pond dam is located in the Oakville section of Watertown, on Steele Brook, a tributary of the Naugatuck River, about 900 feet upstream of the corporate limits between Watertown and Waterbury, Connecticut. The watershed area of Steele Brook at the dam is about 11.9 square miles.

The dam consists of an earthen embankment with a stone masonry overflow spillway located at the end of the dam, with outlet works located to the left of the spillway. The dam is 480 feet long with a maximum height of 23 feet, and the spillway is 100 feet long with the crest about 20 feet above streambed. Below the spillway, a concrete apron extends approximately 22 feet downstream. There is a stone masonry training wall at each end of the spillway.

The dam is in poor condition, with inadequate spillway capacity and a steeply eroded embankment slope. The outlet gates are inoperative, and overtopping could cause dam failure. Because of the inadequate spillway and potential hazard, the CT DEEP has ordered The Old Pin Shop, LLC, to “put the dam in a safe condition.” Without additional funding, the owners will comply with the order by shoring up the embankment and repairing the dam. The Trustees are proposing to fund the removal of the dam which is significantly more costly than repair efforts.

Restoration funds will only be spent to augment the project above and beyond the level already required under the dam safety order.

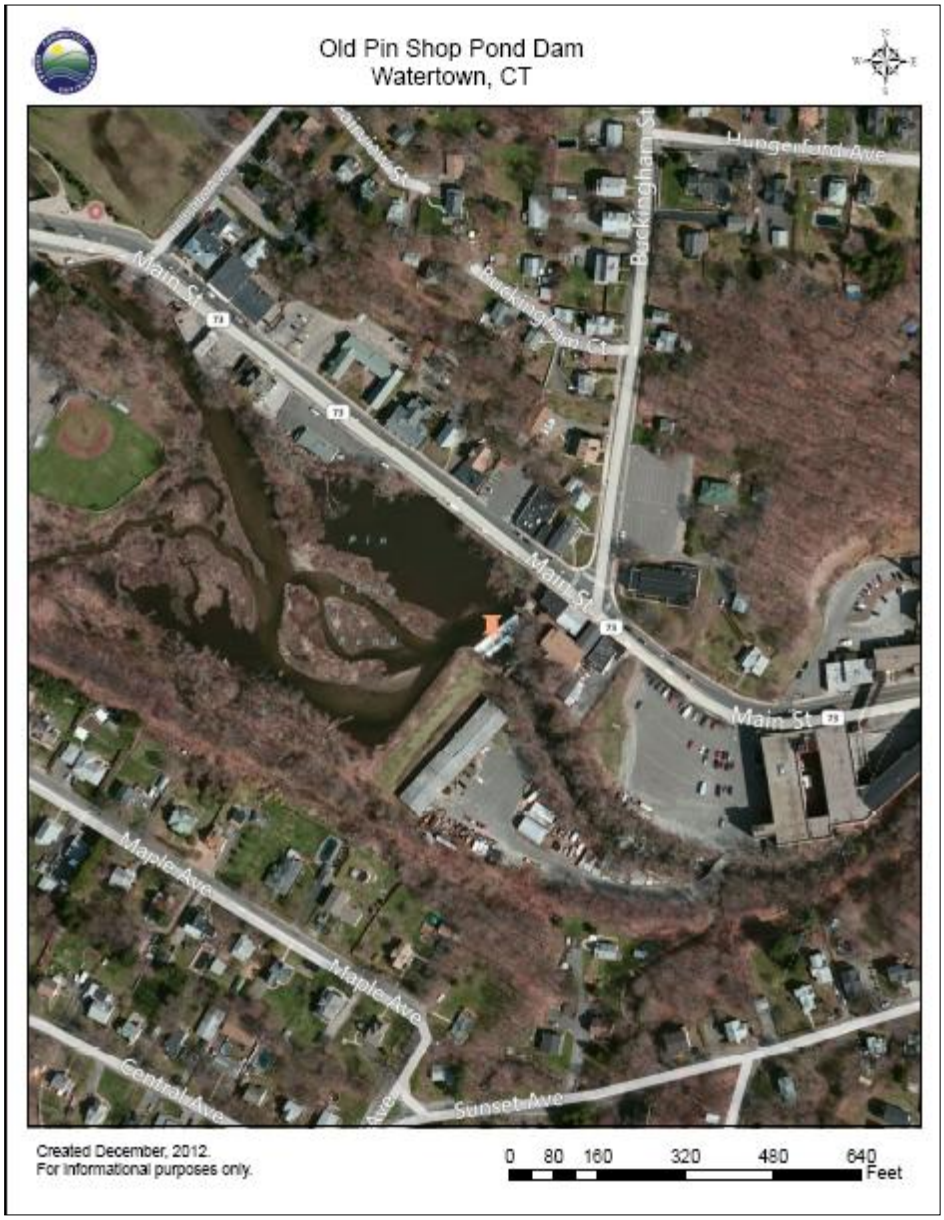

Figure 4. Old Pin Shop Pond Dam. Watertown, CT.

Project Evaluation Summary

Relevance and Applicability

The dam is located on Steele Brook, 2.3 miles upstream of the confluence with the Naugatuck River. Currently, seven species of diadromous fish reach the first dam on the Naugatuck (Kinneytown Dam in Seymour) and are passed through either the Denil fishway or eel pass. The fish then reach the Tingue Dam near Seymour, which is slated to have a fishway constructed in

the near future. Tingue Dam is 14 miles downstream of the confluence of Steele Brook and the Naugatuck River; there are no dams in between.

Technical Merit

Construction plans and specifications are complete, including contract drawings, sedimentation and erosion control plans, a flood contingency plan, and soil scientist reports. There is an approved plan for contaminated soil/sediment disposal. Applications for CT DEEP 401 Water Quality and 404 Army Corps of Engineers (ACOE) permits have been submitted and are in final review stages. All permits will need to be in hand prior to construction; the Trustees want to ensure that the potential for scour of the road embankment is minimized in the final designs.

As verified by the CT DEEP Inland Fisheries Division (IFD), removal of the dam will make 4.6 miles of stream accessible to diadromous fish. Temporary impacts to air quality and noise from construction equipment can be expected, however these will be short-term.

Project Budget

The estimated cost for breaching the dam and disposing of the sediments is $1,300,000, which is $700,000 over the cost of "making it safe" by concrete armoring of the embankment. Breaching the dam will not only make it safe in perpetuity, but will also have the added benefit of making 4.6 miles of stream accessible to diadromous fish. The Town of Watertown received a Regional Brownfields Partnership grant to conduct the Environmental Site Assessment, and a Limited Sediment Quality Investigation has been conducted under contract with the Town and The Old Pin Shop, LLC.

Socioeconomic Merit

Removal of the dam and restoration of diadromous fish species to a densely populated community presents an opportunity to engage a large number of residents in restoration of the river. The CT DEEP Inland Water Resources Division and IFD specifically support dam removal, and The Old Pin Shop, LLC, has agreed to donate a portion of the pond property to the Town of Watertown to be used for ball field expansion and a proposed Steele Brook Greenway. Use of construction equipment in a highly urbanized area will generate increased traffic, however this will be temporary. Minimal impacts to historic resources are anticipated, but the State Historic Preservation Office has been contacted.

Applicant Implementation Capacity

The engineering firm Roald Haestad, Inc., project designer and administrator, has extensive experience in dam repair and modification. The project has the support of the Town of Watertown, which proposes to build the Steele Brook Greenway, and the landowners—The Old Pin Shop, LLC—who have already expended approximately $200,000 on environmental assessments, wetland mapping, engineering design and permit applications.

Summary of Findings

The Old Pin Shop dam removal project is community supported, with nearly half of the funds provided by the dam owner. The project is implementation oriented and feasible, with measurable benefits to diadromous fish species. The CT SubCouncil has allocated $700,000 to remove the dam, contingent upon removal of the downstream weir and completion of the Tingue Dam fish passage project. To help ensure the restoration of Steele Brook and the greater Naugatuck River watershed, the Trustees have also proposed funding the Tingue Dam project (see Project 6, below).

2.2.4 Old Papermill Pond Dam Removal Feasibility Study

Ousatonic Fish and Game Protective Association
Requested NRD Funds: $100,000
Other Contributions: $3,695
NRD Allocation: $100,000

Project Description

This project will fund an Alternatives Analysis to evaluate options for restoring the East Aspetuck River and providing fish passage at the Old Papermill Pond Dam (Figure 5). Final designs, permit applications and estimates of probable cost will also be prepared. Currently, the dam blocks passage for trout and other coldwater species and causes large-scale downstream transport of sand. The dam owner wishes to correct this degradation, but the best solution is unclear. The Alternatives Analysis will be used to select and ultimately implement the preferred alternative. Should fish passage be achieved, the project would reconnect 7.2 miles of the East Aspetuck River above the dam to downstream habitat and the Housatonic River. Diadromous species are not currently present in the East Aspetuck River due to dams on the Housatonic that lack fish passage. However, it is expected that passage facilities will be constructed in the future and that species such as blueback herring, sea lamprey, and American eel will eventually be able to utilize the East Aspetuck River.

Site Description

Old Papermill Pond Dam is the first dam on the East Aspetuck River, a major tributary of the Housatonic River in New Milford, Connecticut. The entire stream is designated by the CT DEEP as a Class 3 “Wild Trout Management Area” and provides habitat for a wild population of brown trout. The dam is located 2.9 miles upstream of the Housatonic River. In addition to being a barrier to fish, this dam has created a chronic problem by accumulating sand and silt, which has filled the impoundment and greatly reduced benthic diversity and suitable trout habitat. In the past, the boards blocking the low level output have been removed one at a time to gradually lower the water level, and massive amounts of sand have been transported downstream, to the detriment of downstream habitat. This practice is no longer allowed and the sand has continued to accumulate above the dam. The dam is constructed of concrete comprising a sharp-crested weir about 12 feet high with a center portion slightly recessed to form a low flow spillway. The low-level outlet is controlled by wooden boards. This dam is the first barrier to fish migration encountered by fish ascending the East Aspetuck River from the

Housatonic River. The next full barrier to upstream fish migration is a 15-foot waterfall downstream of Lake Waramaug and is 7.2 miles upstream of the dam.

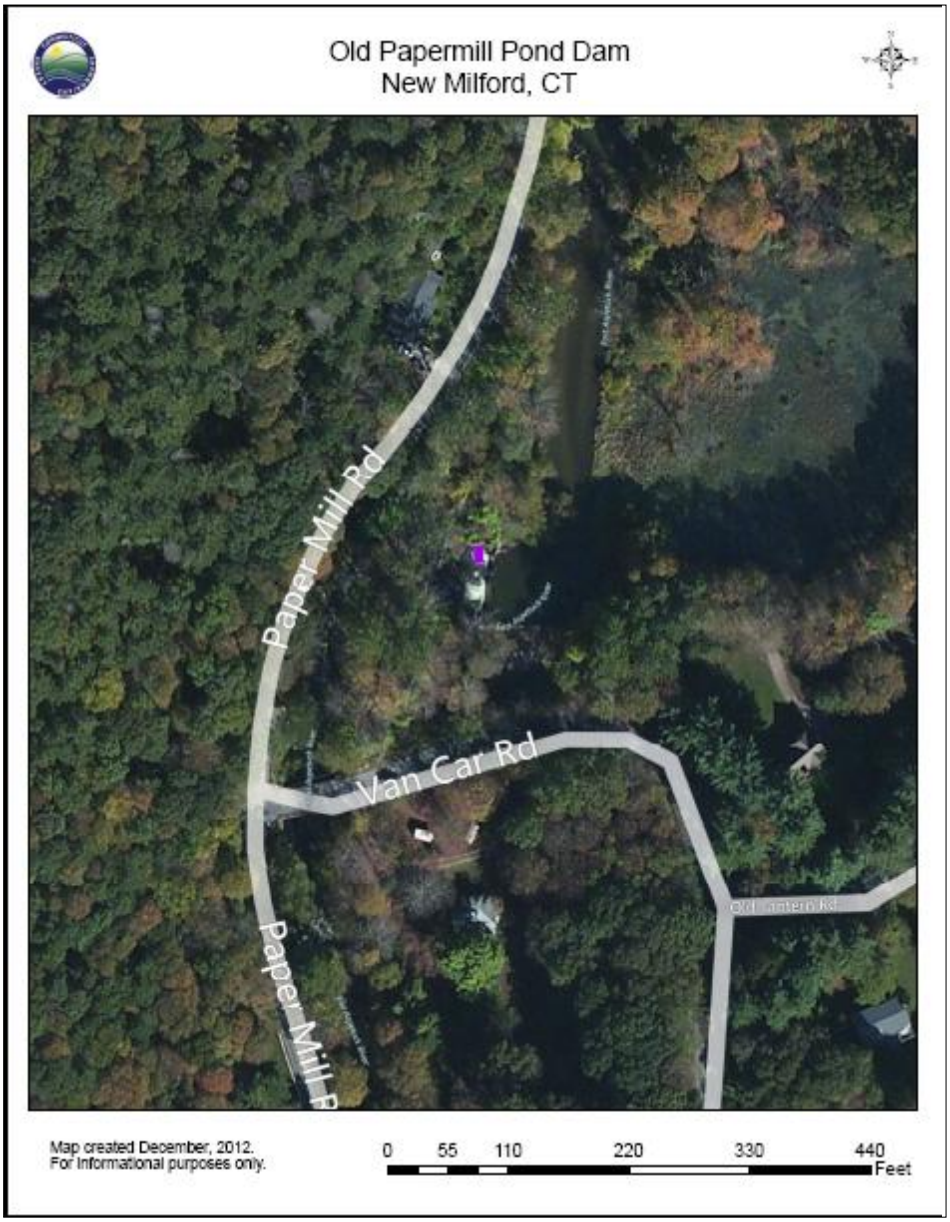

Figure 5. Old Papermill Pond Dam. New Milford, CT.

Project Evaluation Summary

Relevance and Applicability

The East Aspetuck River is a major tributary of the mainstem Housatonic River and flows through a portion of the watershed that is rural and high quality (in terms of aquatic habitat), yet in close proximity to human populations and accessible to diverse users. The habitat in this river is very good both upstream of the impoundment and downstream of the dam, but poor within the

impoundment. Ecological benefits from the removal or modification of the dam include fish passage and habitat restoration. The East Aspetuck River is an important tributary habitat for spawning, nursery and thermal refuge for fish in the Housatonic. Any fish passage project at this dam would re-connect 10.1 miles of the East Aspetuck River (effectively, the entire stream) and also reach into the Housatonic River between the Shepaug and Bulls Bridge dams. Additional benefits include the re-establishment of upstream populations of freshwater mussels which rely on host fish for the movement and dispersal of larval stages of mussels and the enhancement of populations of piscivorous species such as osprey, herons, and otter. The project also complements CT DEEP's efforts to restore diadromous fish runs in the Housatonic River. The project was recently prioritized by CT DEEP due to its potential for restoration of diadromous fish.

Technical Merit

Since the proposed project is to develop an alternatives analysis, technical merit cannot be assessed at this time.

Project Budget

The estimated budget of $100,000 to develop an alternatives analysis and final designs is comparable to expenditures for similar efforts at other project locations. A comprehensive analysis will be prepared, including topographic surveys, sediment sampling (grain size and contaminants), hydraulic analyses, artist renderings, and final designs developed by a qualified engineer.

Socioeconomic Merit

The options that will be developed for consideration will increase safety and accessibility at the property. This will allow the project sponsor to pursue its mission of educating and engaging young people in outdoor sporting activities, sound conservation practices, and learning about the flora, wildlife and sustainable stream management practices that this property can provide. The club routinely holds meetings, fly fishing classes and education events at a pavilion on the property. The added accessibility and safety enhancements would improve the use of the property for children, handicap access fishing and new club-sponsored activities. There is support from several chapters of Trout Unlimited and the New Milford Boy Scout Troops. No adverse socioeconomic impacts are expected.

Applicant Implementation Capacity

Although an engineering firm has not yet been chosen, there are a number of qualified firms that have prepared similar analyses in the state. The CT DEEP IFD has also agreed to provide technical expertise.

Summary of Findings

The current project is to fund an Alternatives Analysis to evaluate how to restore fish passage and river flow in the East Aspetuck River. Final plans and permit applications will also be prepared. This project has the potential to restore a 10.1 mile section of free flowing river (7.2 miles above the dam and 2.9 miles below) which would benefit aquatic species within the East Aspetuck River and the greater Housatonic. There is community support for the project and it is a priority of the CT DEEP. To initiate restoration of the river, the CT SubCouncil has decided to allocate $100,000 to this project. Additional funds may be available for implementation should a suitable alternative be identified.

2.2.5 Housatonic Watershed Habitat Continuity in Northwest Connecticut

Housatonic Valley Association
Requested NRD Funds: $174,408
Other Contributions: $14,000
NRD Allocation: $150,000

Project Description

The project will assess and prioritize culvert barriers to fish and wildlife passage on coldwater tributaries to the Housatonic River in northwest Connecticut, at state and town road crossings, as well as private road crossings owned by Weantinoge Heritage Trust. Assessment will be done utilizing the Conservation Assessment and Prioritization System (CAPs—see more detail under Technical Merit below) for culverts developed by the University of Massachusetts at Amherst, and the expertise of the CT DEEP IFD. This assessment 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.

Site Description

The project's geographic target area includes all "coldwater" tributaries to the Housatonic River mainstem located between the Massachusetts state line and the Town of New Milford, Connecticut (approximately 11 towns). This area may be further refined based upon the number of culverts, technical input from project partners (e.g., CT DEEP IFD and the Connecticut Department of Transportation [CT DOT]), and available resources.

Project Evaluation Summary

Relevance and Applicability

Culvert improvement will enhance the ecological conditions of the Housatonic River system by restoring instream habitat, increasing fish passage, improving water quality (including water temperature and oxygen levels), and restoring natural water velocities and depths. The project will identify instream barriers at select road crossings, evaluate and score each stream's ecological value, and identify sites where culvert replacement would yield the greatest ecological benefits. The project will also evaluate scheduled upcoming culvert replacements by the CT

DOT, municipal Departments of Public Works, and private landowners to ensure that those replacements adhere to Stream Crossing Guidelines.

Technical Merit

The project proposes to use the CAPs, a landscape modeling tool developed by the University of Massachusetts. The CAPs tool assesses ecological integrity by applying a suite of metrics to points in the landscape and integrating this in a weighted linear model developed for the ecological community. The result is an index that depicts the relative ecological integrity and biodiversity value of any point on the landscape. Results will be coupled with stream quality assessments by the CT DEEP IFD, as well as culvert replacement schedules to set priorities for culvert replacement in the Housatonic River watershed. This will ensure that future culvert replacements will restore the greatest degree of ecological function and fish and wildlife passage to these coldwater streams.

Project Budget

The budget provides for staff costs, volunteer training, travel, and equipment, as well as contracted services with Weantinoge Heritage Trust and the University of Massachusetts. Expenses associated with implementing culvert replacement are expected to be funded by the Connecticut Department of Transportation and local municipalities.

Socioeconomic Merit

The Housatonic Valley Association (HVA) will recruit and train volunteers to assist with locating and assessing the culverts in the Housatonic watershed's coldwater streams. The HVA currently works with the CT DOT, as well as municipal and regional transportation agencies, regarding culvert replacement considerations in road project planning, and will continue to coordinate with these agencies. No adverse socioeconomic impacts are expected.

Applicant Implementation Capacity

The project team has demonstrated technical and administrative experience implementing similar projects in the watershed.

Summary of Findings

Considering the high cost of culvert replacement, the development of a tool capable of assessing barriers to fish and wildlife passage will be valuable in identifying where replacement will yield the most ecological benefit. The budget is consistent with a similar effort undertaken in Massachusetts, and, given the capabilities of the HVA, the expertise of the participating partners, and the existing relationships with the CT DOT and municipal and regional transportation agencies, the project is likely to yield implementable results. Therefore, the CT SubCouncil has awarded $150,000 to this project.

2.2.6 Tingue Dam Fish Passage

CT DEEP Bureau of Water Protection and Land Reuse, Planning and Standards Division
Requested NRD Funds: $672,000
Other Contributions: $4,750,000
NRD Allocation: $672,000

Project Description

This project proposes to construct a bypass channel around the Tingue Dam (Figure 6) to provide passage to diadromous fish on the Naugatuck River. Completion of the project will immediately restore access for American shad, blueback herring, alewife and American eel to 32 miles of essential habitat for spawning, juvenile rearing, and growth. The re-establishment of these self-sustaining fish populations will have many indirect ecological benefits such as increased populations of predators, including osprey, bald eagle, striped bass, bluefish, seals, porpoises, colonial nesting birds, otter, and mink, as well as increased transportation of many mussel species to upper watersheds.

The fish bypass channel around the Tingue Dam will be created through excavation and removal of fill, and the channel will include habitat features to ensure diadromous fish passage success. The site will be stabilized and streamside habitat restored to promote infiltration of storm water by the use of pervious paving and native vegetation landscaping techniques. Post-construction activities will include monitoring the fishway in two ways: visual observations of fishes actively migrating up the fishway, and documentation of physical and hydraulic conditions.

Feasibility studies, selection of a preferred alternative, final design, and necessary property easements, acquisitions and consents are complete. Permits required for the project are dam safety, flood management, 401 water quality, and an ACOE programmatic general permit (PGP). All had been previously issued, but must be renewed or reissued because expiration dates have passed. Since the applications and work scope have not changed significantly, all permits should be reissued. Original project costs have increased due to refinement of soil contaminant remediation costs, as well as a detailed breakdown of other project costs and the addition of contingency funds to the budget.

Site Description

The dam is located in Seymour, Connecticut, where CT Route 8 crosses the Naugatuck River. It is a run-of-the-river masonry dam, approximately 150 feet long, varying in height from 5 to 15 feet, and built on top of an apparent gorge or irregular bedrock outcrop. On the southwestern end of the dam, there is a 57-foot-wide section of natural ledge spillway that varies in elevation (at maximum, three feet lower than the crest of the stone masonry spillway). Northeast of the central stone masonry spillway, the crest of the dam turns east along a small section of exposed ledge, then continues along a 26-foot-long reinforced concrete wall. East of the wall is an abandoned factory intake structure. There is no water use at the site and all stream flow spills over the spillway or an adjacent bedrock ledge. To the south is a town park; to the north is a

parking lot. The dominant feature is the CT Route 8 highway bridge that spans the river above spillway. Support piers for the bridge are anchored into bedrock adjacent to the dam.

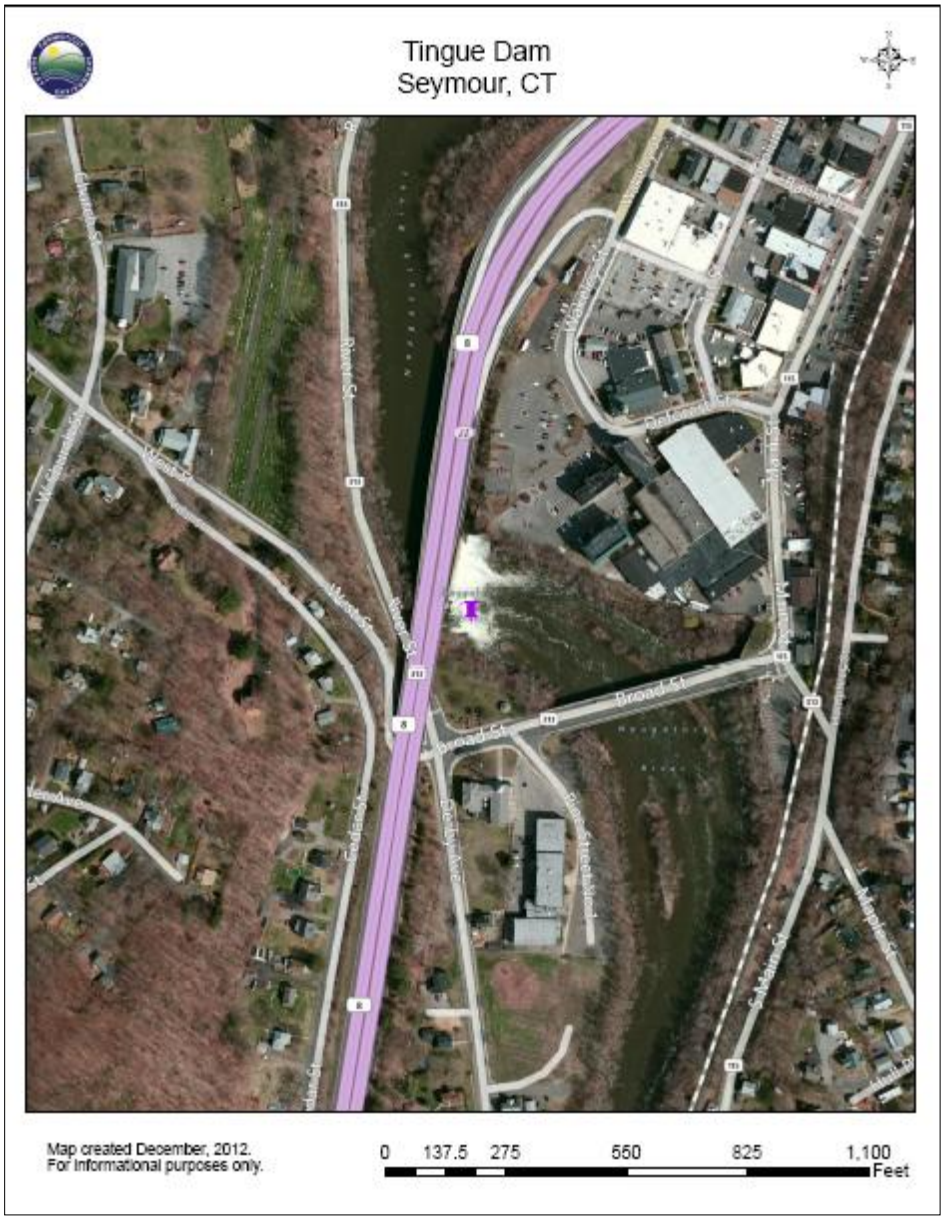

Figure 6. Tingue Dam. Seymour, CT.

Project Evaluation Summary

Relevance and Applicability

The Naugatuck River watershed (310 square miles) joins the Housatonic River eight miles upstream from Long Island Sound, near the head of tide. Passage around the Tingue Dam complements a series of eight dam removal and fish passage projects: six on the Naugatuck River from Ansonia (near the confluence of the Naugatuck and Housatonic Rivers) upstream

approximately 23 miles to Thomaston, and two on tributaries. The Naugatuck River, once dominated by untreated sewage and industrial waste, has undergone marked improvements in water quality and has become a coldwater fishing destination in Connecticut. Reconnecting remnant runs of diadromous fishes to historical upstream habitats will extend these improvements and foster the restoration of thriving and self-sustaining populations. Targeted fisheries management programs to ensure continued or added value to the Tingue Dam bypass project include maintenance of the bypass channel and building fish populations.

Technical Merit

Plans to restore the Naugatuck River at the Tingue Dam have been under development for a number of years. The consulting engineering firm of Milone & MacBroom, Inc., which has considerable hydraulic expertise and experience with rivers, initially performed an alternatives analysis. After years of collaboration and consultation with federal, state, and local agencies, and other partners, the consultant completed detailed site plan drawings and specifications that represent the most feasible option for fish passage. These plans have been used by CT DEEP's Inland Water Resources Division to develop a draft "Project Specifications for Tingue Dam Bypass Channel, Seymour, Connecticut". Construction-related permits (dam safety, flood management, 401 water quality, and ACOE PGP) that had been issued for the project have expired, and an expedited reissuance of them is anticipated within 90 days of project initiation. The project is ready for implementation as soon as a contractor is selected and awarded a contract.

Project Budget

Implementation of the entire project was expected to cost up to $4,750,000, with $2,500,000 in Federal funds requested and $2,250,000 available as State Match funds. Updated budget figures provide detailed budget costs, including refined costs for controlled materials disposal, bringing the total project cost to $5,422,000, including a 10 percent contingency. The project sponsor has requested the difference between these two project costs from the CT SubCouncil.

Socioeconomic Merit

The Naugatuck River is a highly-urbanized watershed and there are several distressed communities in the river corridor in close proximity to the project, including Ansonia, Derby, Naugatuck, Waterbury and Torrington. The project will afford greater access and value to residents for recreation and aesthetics in these economically disadvantaged areas. The restoration of diadromous fish populations is expected to generate long-term increases in economic activity in tourism and recreation related to fishing, and increases in property values. Citizen groups and communities along the river have played a key role in driving the Naugatuck River restoration process and have made additional improvements on their own. River advocacy groups have conducted river cleanups, fish stocking, revegetation projects, volunteer water quality and biological monitoring, and sponsored river celebrations and "on the water" events such as canoeing and kayaking. The project will provide excellent opportunities for public outreach and education; the facility will be open to the public for self-guided tours and include informational kiosks.

Applicant Implementation Capacity

The CT DEEP has administrative, legal, information technology, and clerical support services capable of overseeing and implementing the project. The Bureau of Water Protection and Land Reuse, Planning and Standards Division (PSD) will be assisted by the Inland Water Resources Division and staff from the IFD. The supervisor of the IFD's Diadromous Fish Program will also be involved. The supervisor has over 30 years of experience with fish passage and diadromous fishes and has been involved in the planning of the Tingue Dam Fish Bypass Channel from its inception.

Summary of Findings

There has been a 20-year concerted effort to restore the water and habitat quality of the Naugatuck River, including removal or passage provisions for migratory and diadromous fishes. Planning for the Tingue Dam bypass project has been in progress for approximately a decade. This project has been designed, specifications have been prepared, and expedited reissuance of expired construction-related permits is anticipated within 90 days of project initiation. Given the implementation-readiness of the project, as well as the level of progress made in the Naugatuck River and watershed, and the biological and socioeconomic benefits to be derived, the CT SubCouncil has awarded $672,000 to this project.

2.2.7 McKinney NWR, Great Meadows Unit Marsh Restoration

FWS, NOAA and CT DEEP Wetlands Habitat and Mosquito Management Unit
Requested NRD Funds: $360,000
Other Contributions: $700,000
NRD Allocation: $300,000

Project Description

The project proposes to restore salt marsh communities that will provide estuarine fisheries habitat, and other ecological functions, as well as enhance degraded wetland and coastal upland habitats at the Great Meadows Unit of the Stewart B. McKinney National Wildlife Refuge in Stratford, Connecticut (Figure 7). Historic deposition of fill directly on the marsh and construction of berms severely reduced the ecological value of the marsh.

The proposal contains six specific projects to be implemented at various sites on the property. Approximately 30 acres of marsh restoration are proposed. Practices will include constructing tidal channels and removing berms to increase tidal exchange to degraded salt marsh and freshwater ponded areas, modifying or replacing defunct flapgates to restore tidal exchange, removing fill from historic marsh habitat, and controlling invasive species. These activities will result in restoration of low marsh and high marsh, protection of marsh pink (*Sabatia stellaris*) habitat and populations, protection and enhancement of northern diamondback terrapin (*Malaclemys t. terrapin*) nesting habitat, restoration or enhancement of saltmarsh sparrow (*Ammodramus caudacutus)* and seaside sparrow (*Ammodramus maritimus*) habitat, invasive

vegetation control, salt marsh mosquito production control, as well as improved public access and education.

Site Description

The Great Meadows Unit of the Stewart B. McKinney National Wildlife Refuge (NWR) in Stratford, Connecticut (Figure 7) is comprised of 492 acres of tidal wetland and upland habitat, and contains the largest unditched saltwater high marsh in Connecticut. It is part of a 750-acre tidal marsh system that includes the open water of Lewis Gut and marshes on the barrier beach mainland sides. It is recognized by the FWS (Atlantic Coast Joint Venture Plan of the North American Waterfowl Management Plan) and the Connecticut Audubon Society as an important area for migratory birds (IBA), providing feeding and nesting habitat for over 270 bird species including songbirds, raptors, shorebirds, waterfowl and wading birds. It is an important wintering area for the American black duck and diving ducks such as scaup, common goldeneye, and bufflehead. Intertidal flats of the Great Meadows Unit are prime feeding areas for wading birds such as egrets and herons. Lewis Gut, which channels water into the marsh from Long Island Sound, contains one of the most productive shellfish beds in the state and provides breeding and feeding grounds for several species of finfish.

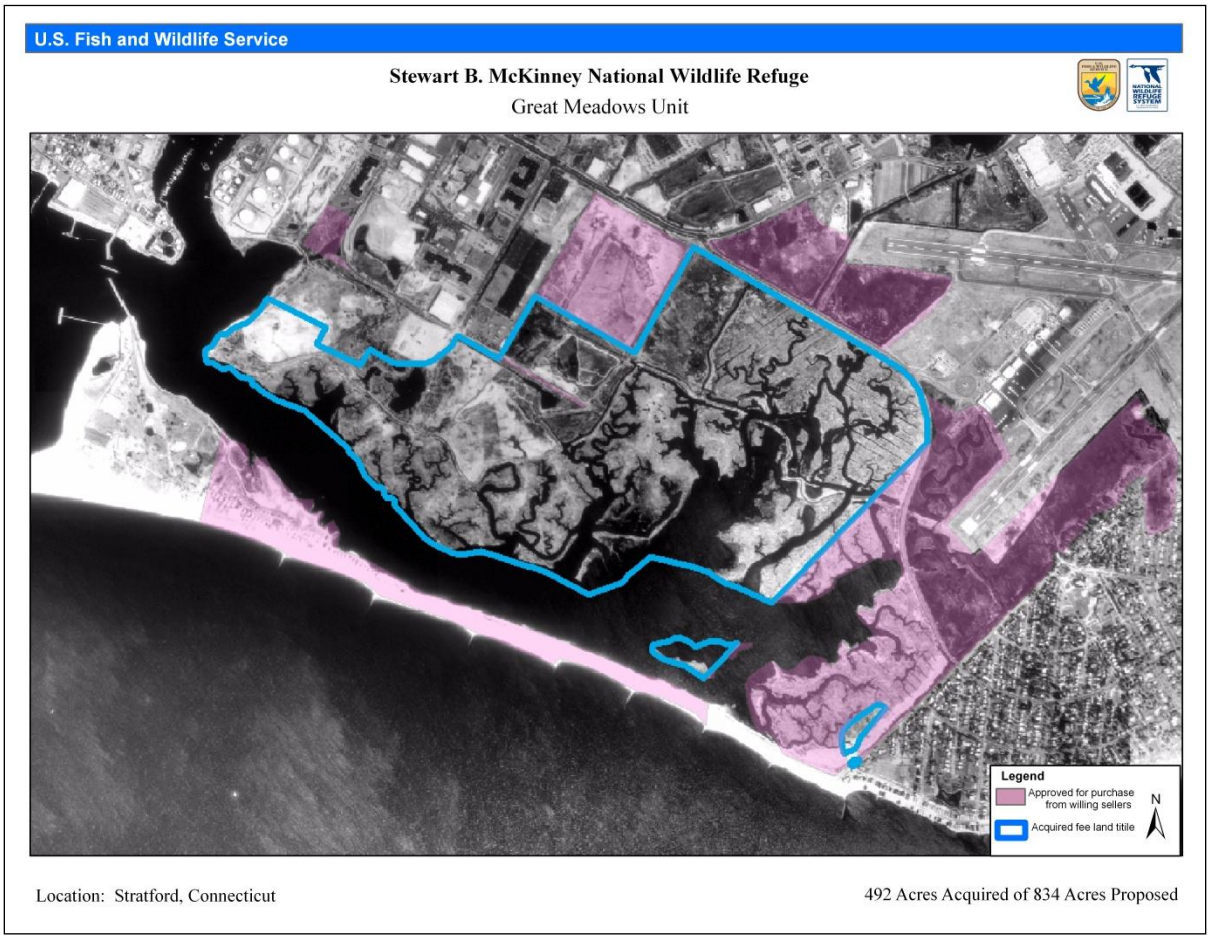

Figure 7. Great Meadows Unit. Stratford, CT.

Project Evaluation Summary

Relevance and Applicability

The project practices will further regional habitat goals and improve habitat for multiple trust species, as well as restore ecological functions and services, and provide research and monitoring opportunities. The project is a high priority for the NWR and is a component of the Refuge's developing comprehensive conservation plan. Restoration of the area is supported by the CT DEEP; other portions of the marsh were successfully restored in 2005 and 2006 through permitting requirements issued by the Department. The current restoration efforts will likely be supported through funds from other Natural Resource Damages Settlements (see Project Budget, below). Finally, the project area is located near Long Beach West, which recently underwent a large-scale dune restoration project in 2010 and 2011 to demolish cottages and associated structures and is proposed for additional funding through implementation of Project 2 (above). Together, both of these restoration efforts will benefit the larger tidal marsh area which is of regional and national significance.

Technical Merit

There are a number of opportunities to restore and enhance former and degraded saltmarsh on portions of the NWR Great Meadows Unit. Projects were conceived with input from the FWS and the CT DEEP Wetland Habitat and Mosquito Management Unit, which is nationally recognized as a leader in marsh restoration. The proposed restoration techniques have been used elsewhere throughout the northeast to successfully restore salt marsh habitat and it is highly likely that the projects will achieve the stated objectives. Some impacts can be expected from the spoil material; however, these will be minimized as much as possible. Any potential contamination issues will be evaluasted and addressed. Suitable precautions will be taken to protect populations of state-listed marsh pink, northern diamondback terrapin, saltmarsh sparrow and seaside sparrow.

Project Budget

A preliminary budget has been provided for each of the six project alternatives at the site. The estimated total cost of the projects is $1,060,000. It is anticipated that approximately $700,000 will be available from the Lordship Point/Raymark Natural Resource Damage Assessment and Restoration settlement funds. A Restoration Plan to identify proposed alternatives for these funds is expected in mid-2013.

Socioeconomic Merit

The project site is part of the Stewart B. McKinney National Wildlife Refuge and thus is open to the public, providing outreach and education regarding tidal marsh restoration. The proposed projects are not expected to generate adverse socioeconomic impacts.

Applicant Implementation Capacity

Project stakeholders include the CT DEEP and the FWS, agencies with the capacity and capability to undertake and manage these projects. The CT DEEP Wetlands Habitat and Mosquito Management Unit has significant experience in tidal marsh restoration and is uniquely qualified to oversee and implement these projects.

Summary of Findings

The six project alternatives, which will be implemented on approximately 30 acres of marsh and upland, represent a thorough and complete approach to marsh restoration that is implementation-oriented, feasible, and will provide numerous measurable benefits to tidal marsh and aquatic natural resources throughout the larger marsh complex. The CT SubCouncil has chosen to allocate $300,000 to these projects. These funds will likely be combined with money from the Lordship Point/Raymark settlement to increase the overall restoration effort.

2.3 Alternatives Considered But Not Recommended For Funding

The CT SubCouncil did not allocate funding for several Aquatic Natural Resources projects. Based on the project evaluations, there are a variety of reasons that these projects are not proposed for funding, including lack of connection to the impacted resources of the Housatonic River, limited ecological benefit, and funding limitations.

2.3.1 Leete's Island

CT DEEP Wetlands Habitat and Mosquito Management Unit
Requested NRD Funds: $350,000
Other Contributions: $72,324
NRD Allocation: $0

Project Description

This project will restore the tidal marsh at Leete's Island by repairing the leaky 42"-diameter pipe, and replacing the old flapper-style tide gate with a new flap gate that has the ability to be raised and lowered vertically. Currently, too much water enters this subsided marsh at high tide when the gate is in its open position and portions of the marsh remain saturated, even at low tide. The new tide gate will be installed such that the 42"-diameter pipe functions as a smaller pipe during the flood tide, but functions to its fullest capacity for low tide drainage.

Site Description

Leete's Island marsh is a 40-acre tidal wetland located along the coast in southwestern Guilford, Connecticut. The property is privately owned, and has been held by the same family, the Leete family, since colonial times. Until recently, they have farmed the marsh for salt hay (*Spartina patens*), but the system has subsided in elevation and is too wet to sustain much vegetation. Historically, the hay was harvested once per year. The marsh is connected to Island Bay and Long Island Sound by a man-made channel; this primary tidal creek is effectively the backbone

of the remnant grid pattern of mosquito ditches in the marsh, similar to those found throughout many of Connecticut's tidal wetlands. The mouth of this creek has been piped and flows underground, under Shell Beach Road and one residential property, and finally empties into Island Bay. There is also a tide gate in an underground concrete chamber, which acts to drain the marsh at low tide, and it was this practice of draining the marsh that has caused subsidence of the marsh surface.

Project Evaluation Summary

Relevance and Applicability

The project is located along the coast, in Guilford, Connecticut, which is, notably, outside the Housatonic River watershed and removed from any resources injured by the release from the GE Pittsfield facility. The Leete family has agreed to set aside 15.5 acres of the marsh as undisturbed, and further, that the new tide gate will be managed for tidal marsh restoration rather than for salt hay production. However, there is the potential that salt hay operations could be resumed in the future, if the salt hay were to become re-established at harvestable levels.

Technical Merit

Design plans and construction methodology have been prepared to repair the leaky pipe and replace the old tide gate. Researchers from Yale University have installed nine permanent Sediment Elevation Tables to get baseline data on marsh elevation surface and track long-term changes, including how the marsh surface responds to the new tidal regime.

Project Budget

Based on the engineering firm's estimate, construction costs are approximately $400,000 for the necessary repairs.

Socioeconomic Merit

Although the property is privately owned and there will be no community involvement, there is support for the project from the family and partnerships with Yale University and through the CT Corporate Wetlands Restoration Partnership.

Applicant Implementation Capacity

Having many years of successful marsh restoration experience, the CT DEEP Wetland Habitat and Mosquito Management Unit is qualified and capable of implementing this project and the firm Fuss and O'Neill, Inc. has extensive experience in tide gate renovation.

Summary of Findings

While renovations to the tide gate are likely to restore the marsh to a self-sustaining ecosystem, the site is outside the Housatonic River watershed and would provide very limited benefits to

river-related natural resources. Additionally, if conditions allow for salt hay production, the potential exists for the family to receive financial profit from the restoration project. Based on these factors, the CT SubCouncil has decided this project should not receive NRD funding.

2.3.2 Heminway Pond – Steele Brook Pond Dam Removal

Town of Watertown
Requested NRD Funds: $700,000 - $1,100,000
Other Contributions: $211,000
NRD Allocation: $0

Project Description

The project proposes a full removal of the Heminway Pond Dam, which has been owned by the Town of Watertown, Connecticut since 2007. Currently, the dam restricts fish passage in Steele Brook, impounds a pond with increased water temperatures and high bacteria levels due to high geese populations, and encourages deposition of iron precipitate in the stream channel just downstream of the dam. A dam removal Feasibility Analysis has been completed with the goals of water quality improvements in Heminway Pond and Steele Brook, fish passage improvements through the dam and pond area, removal of the liability of an aged dam from the Town of Watertown, and, incorporation into a larger Town greenway project. The Feasibility Analysis evaluated four alternatives and, to address the identified project goals, recommended the full removal of the spillway, including elimination of the pond and creation of a new channel/floodplain system in the pond area.

Site Description

Heminway Pond is an impoundment on Steele Brook, just upstream of Echo Lake Road and adjacent to Deland Field and Heminway Park School, in the Town of Watertown, CT. Significant amounts of sediment have entered the pond area and settled behind the dam and within the impoundment; it is shallow with maximum depths of about four feet. The backwater area of the pond is approximately 5.5 acres in size, while the pond, dam and associated upland area total approximately 14.5 acres, and is seen as a potential site for future active and passive recreation.

Portions of Steele Brook have been on the CT DEEP's list of impaired waterbodies (developed pursuant to Section 305 (b) of the Clean Water Act) since 2002. In the area directly downstream of Heminway Pond, the water quality does not meet state water quality standards. Between the dam and Echo Lake Road, there is a major local impact to water quality through iron precipitate settlement during low flow periods; there has been concern in this area due to orange discoloration of the water, turbidity, and loss of habitat caused by flocculation. The full removal of the spillway has been identified as a solution to improving the water quality and therefore improving habitat in the area downstream of Heminway Pond.

Project Evaluation Summary

Relevance and Applicability

The dam is located on Steele Brook in the Town of Watertown, CT. There are a number of fish species in the Brook, including stocked brown trout, however temperatures in this downstream section of the watershed are warmer than in the less developed upstream areas, partially due to ponding of water behind the dams, diminished riparian vegetation, and runoff from impervious surfaces, all of which contribute to the decline in species richness for these downstream areas. Removal of the spillway would allow the healthier stream community currently found upstream of the dam influence to extend downward to Heminway Pond area.

Technical Merit

Full removal has been determined as the recommended action, and design plans are expected to be completed in 2012. Although there would be loss of open water, removal of the dam would result in the addition of emergent wetlands as well as a functioning floodplain wetland throughout the stream system, additional fish passage and cool water stream habitat, as well as wildlife habitat. Sediment transport would occur more naturally and the increased flow within the channel may aid in decreasing the amount of iron precipitate that accumulates between the dam and Echo Lake Road.

Project Budget

Although design plans are not yet complete, an anticipated detailed project budget of $1,100,000 has been provided, with the qualification that a large percentage of the estimated cost is for the removal of material off-site; by using all of the material on-site, the cost estimate can be reduced to $700,000. The amount is a reasonable estimate for a project of this type.

SocioEconomic Merit

The Town of Watertown is committed to significant improvements within the Steele Brook watershed. Dam removal would improve recreational fishing and provide an excellent opportunity to educate the community and other visitors about the importance of stream systems and habitat. The Town has partnered with many agencies, including the CT DEEP, the U.S. Department of Agriculture, the Natural Resources Conservation Service, the Watertown Fire District, the Watertown Land Trust, the Council of Governments of the Central Naugatuck Valley, the Siemon Company (previous owners of the property), American Rivers, and the National Park Service. A Steele Brook Advisory Committee has been established to address a broad range of issues within the watershed, and there has been significant public support on a number of ongoing initiatives within the watershed. The Watertown Town Council has supported Steele Brook initiatives with in-kind services through the Department of Public Works, as well as with financial support to non-federal cost sharing requirements. Connecticut State Archeologist Nicholas Bellantoni, Ph.D., visited the site and requested that prior to construction activities, the wall should be photo documented to conserve in photo format the historic value of the rock-lined channel and mortared stone wall.

Applicant Implementation Capacity

The Town is committed to undertaking significant improvements within the Steele Brook watershed, particularly the removal of the Heminway Pond dam, and has demonstrated an ability to successfully partner with other agencies and organizations. A detailed project design is expected to be completed in 2012.

Summary of Findings

The Heminway Pond dam is located upstream of the Pin Shop Pond dam. Any fish passage benefits to be gained by removal of the Heminway Pond dam cannot be realized without prior removal of the Pin Shop Pond dam. Given the combined expense of both projects and limited funding available, the CT SubCouncil has decided to prioritize the Pin Shop Pond dam and to withhold funds for the Heminway Pond project. The Trustees have prioritized removal of dams farther downstream in the watershed.

2.3.3 Eel Project

Sponsor: Housatonic Environmental Action League (HEAL) and Housatonic River Initiative
Requested NRD Funds: $1,000,000
Other Contributions: Matching funds should lower above cost
NRD Allocation: $0

Project Description

Since the mid-1980s, there has been a drop in the coast-wide numbers of adult American eels. The cause of the decline is poorly understood, and although the coast-wide decline is unlikely a consequence of PCB contamination, the effects of PCBs on eel populations in the Housatonic watershed are largely unknown.

The sponsors propose to analyze archived eel samples to determine recruitment, growth, and production on the Housatonic River. Their proposed work evaluates whether chemicals (i.e., PCBs) in female eels are sufficiently concentrated to cause toxicity to their offspring, and to assess the potential consequences on annual variation in numbers of migrants, timing of the migration, and environmental cues. They also propose to estimate the amount of habitat required to support the production of one silver eel, although the methods for such assessment are not fully described.

The sponsors are proposing to conduct a feasibility study to determine which Housatonic tributaries (and their inland watercourses), from Long Island Sound to the Massachusetts border, possess the most advantageous conditions (e.g., habitat, water quality, ability to exit) for eel reintroduction. If a tributary presents to be ideal and is obstructed to eel passage, they would like to further investigate the possibility of eel passage devices and/or dam breaching.

Lastly, the sponsors will identify sites to install interpretive eel displays.

Site Description

The area of interest includes the entire Housatonic River watershed through the current area of eel migration.

Project Evaluation Summary

The status of American eel in the Housatonic River basin is fairly well understood (Steve Gephard, CT DEEP). Eels are able to surmount the one mainstem dam (Derby Dam) and several tributary dams downstream of the Stevenson Dam, although in many cases, well-designed eel passes would expedite the migration. Few, if any, eels are able to surmount either the Stevenson or Shepaug dams, as both are tall (approximately 100 feet high) concrete structures managed so as to minimize periods of spill. As eels require a wetted surface to use adhesion to scale a concrete surface, the extended periods of no-spill create an effective barrier to juvenile eel passage. The CT DEEP and the FWS have made arrangements through the Federal Energy Regulatory Commission and the CT DEEP's 401 Water Quality Certificate to have eel passes provided at these two dams (as well as the Bull's Bridge Dam) on a specific timetable by the dam owner. A functioning interim eel pass is already in place at the Stevenson Dam. It is assumed that with these facilities in place, eels will begin to re-colonize the mainstem Housatonic River and spread out into the tributaries from there. Many of the tributary dams are small and stone-faced and therefore eels will be able to surmount them once they have access to the dams. Other tributary dams may need eel passes but will have to be assessed by experts to make that determination. The CT DEEP IFD will be making these dam-by-dam assessments, beginning with the downstream tributaries and moving upstream.

The CT DEEP and the CT Department of Public Health have already sampled for PCBs, and those levels of contaminants are already known. Although knowledge of the impact to eels from PCB releases is valuable, such research is better funded by granting agencies interested in toxicology and risk assessment, not one attempting to enhance restoration.

Relevance and Applicability

As above, the feasibility study for eel passage is unnecessary and the PCB impacts to eels are too broad for the funding available from the Trustees.

Technical Merit

We agree that an understanding of PCB impacts to eels is valuable, but we do not believe our funding is appropriate for that purpose.

Project Budget

The estimated budget of $1,000,000 is currently too vague to fully evaluate.

SocioEconomic Merit

There has been little provided by the sponsors to enhance our knowledge of the potential economic benefits of the proposed project.

Applicant Implementation Capacity

The research component of the proposal is costly and does not result in direct restoration of eels to the upper portion of the river. The sponsors also propose to investigate the potential for installing eel passage devices. This effort is already being made by the CT DEEP. Finally, it is unclear whether installation of eel passage structures is included in the project budget.

Summary of Findings

The Trustees decline to fund this proposal. The project is primarily research oriented and duplicates efforts already being undertaken by CT DEEP and is not directly related to the restoration, replacement or acquisition of injured resources. The cost of the project is very high ($1,000,000), and it provides limited, indirect benefits to American eels.

3.0 POTENTIAL IMPACTS OF ALTERNATIVES

Both NEPA and CEPA require that the Trustees evaluate the potential impacts of their proposed actions. The Trustees evaluated each proposed restoration alternative with respect to its potential to impact, either adversely or beneficially, the natural and socioeconomic environments of the project area. Anticipated impacts are shown in Table 2. Further explanation is given below for the potential consequences that are listed in Table 2 as other than "No Impact."

Table 2. Potential Environmental and Socioeconomic Consequences of Alternatives

	No Action	P 1 – Power Line Marsh Restoration	P 2 – Long Beach West Tidal Marsh Restoration	P 3 - Pin Shop Pond Dam Removal	P 4 – Old Papermill Pond Dam Removal Feasibility Study	P 5 – Housatonic Watershed Habitat Continuity in NW CT	P 6 – Tingue Dam Fish Passage	P 7 - McKinney NWR, Great Meadows Unit Marsh Restoration
Environmental Consequences:								
Consistency with Land Use Policies	NI	NI	NI	NI	NI	Project sites not yet delineated	NI	NI
Surface Water Resources	NI	+	NI	+	Not yet assessable	Project sites not yet delineated	NI	NI
Groundwater Resources[1]	NI	NI	NI	NI	Not yet assessable	Project sites not yet delineated	NI	NI
Flood Hazards	NI	NI	NI	+	Not yet assessable	Project sites not yet delineated	NI	+
Biological Resources	NI	+	+	+	+	Project sites not yet delineated	+	+
Landscape	NI	NI	NI	NI	Not yet assessable	NI	NI	NI
Air Quality	NI	NI	NI	-	Not yet assessable	-	-	NI
Noise	NI	NI	NI	-	Not yet assessable	-	-	NI
Solid Waste and Hazardous Materials	NI	NI	NI	-	Not yet assessable	Project sites not yet delineated	-	Unknown
SocioEconomic Consequences:								
Environmental Justice	NI	NI	NI	NI	NI	Project sites not yet delineated	+	NI
Community Facilities and Services	NI	+	NI	+	+	Project sites not yet delineated	+	NI
Aesthetic/Visual Resource Impacts	NI	+	+	+	NI	Project sites not yet delineated	NI	+

Public Utilities and Services	NI	NI	NI	NI	NI	NI	NI	NI
Cultural Resources	NI	NI	NI	NI	NI	NI	NI	NI
Traffic and Parking	NI	NI	NI	-	NI	Project sites not yet delineated	-	NI

- Key to Table: NI: indicates project will have no impact, + indicates project will have a positive impact, - indicates project will have an adverse impact
- [1]No projects fall within a designated Aquifer Protection Area.

3.1 Power Line Marsh Restoration

Environmental consequences

- Beneficial consequences – The enhanced wetland will improve water quality through pollution abatement. The abundance and diversity of invertebrates, fish, and birds is expected to increase.
- Adverse consequences – The project will be conducted outside of the bird nesting season in order to avoid potential disturbance to nesting birds. Additionally, a search of the NDDB indicates that state-listed salt marsh bulrush occurs in the area. Plants will need to be identified and protected during project implementation.

Socioeconomic consequences

- Beneficial consequences – The additional pools, in conjunction with the common reed removal project, will further restore the area to a more natural aesthetic quality and, if future common reed control is implemented under this project, the reduced fire risk will ease the burden on local fire departments.
- Adverse consequences – There are no anticipated adverse socioeconomic impacts.

3.2 Long Beach West Restoration

Environmental consequences

- Beneficial consequences – Wildlife will benefit from the removal of nonnative vegetation which has limited habitat value. In particular, a NDDB search indicates that piping plovers and least terns are known to occur in the area; removing common reed will enhance foraging and nesting habitat for these rare shorebirds.
- Adverse consequences – In order to avoid impacts to sensitive species, licensed pesticide applicators will carefully coordinate the timing and application of herbicides. Beach needle grass (state endangered) is reported on the site; this must be located and avoided through careful herbicide application during project implementation. Ipswich sparrow and seabeach sandwort (state special concern) have been reported in the vicinity; a survey of the project area for these species and appropriate precautions should be undertaken prior to project implementation.

Socioeconomic consequences

- Beneficial consequences – The area will be restored to a more natural state, allowing regrowth of native vegetation and improving the aesthetic quality of the barrier beach and salt marsh.
- Adverse consequences – There are no adverse socioeconomic impacts.

3.3 Pin Shop Dam Removal

Environmental consequences

- Beneficial consequences – Removing the dam will eliminate the current potential flooding hazard should the dam overtop. The project will also result in disposal of contaminated sediments, effectively removing them from contact with biological receptors. Restoration of riverine flows is likely to increase oxygen content of the water and to decrease the temperature of the water, both improving the water quality of the Brook. Removal of the dam will allow instream migration of resident aquatic species as well as migration of diadromous fish once the Tingue Dam is passable.
- Adverse consequences – There are approximately 15,000 cubic yards of contaminated sediment to be removed to create the new channel through the old pond. These materials will be disposed of in the southwestern corner of the pond, capped, covered and seeded, in accordance with a CT DEEP approved plan. Temporary impacts to air quality and noise from construction equipment can be expected, however these will be short-lived.

Socioeconomic consequences

- Beneficial consequences – The project is expected to have a positive impact on public safety by removing an unsafe dam. This will also improve the aesthetic quality of the area for the enjoyment of the community and provide an opportunity for public education. Additionally, the creation of a public greenway and park will provide recreational benefits to the community.
- Adverse consequences – Bringing construction equipment into an urbanized area is likely to generate short-term traffic disruptions.

3.4 Old Papermill Pond Dam Removal Feasibility Study

Environmental consequences

- Beneficial consequences – Although strictly an alternatives analysis at this point, it is the first step in implementing a project that will result in the removal of a barrier to migratory fish and improve water quality.
- Adverse consequences – There are no adverse consequences associated with preparing an alternatives analysis. Consequences associated with implementation of alternatives will be assessed through the applications for local, state and federal permits, as needed.

Socioeconomic consequences

- Beneficial consequences – Evaluating restoration options for the East Aspetuck River contributes to furthering the landowner's mission of outreach and education related to outdoor sporting activities and natural resource conservation.
- Adverse consequences – There are no adverse socioeconomic consequences anticipated.

3.5 Housatonic Watershed Habitat Continuity in NW CT

Until the analysis portion of the project is complete and sites have been prioritized, the environmental and socioeconomic impacts cannot be fully assessed. If funding is utilized to replace any culverts, it is likely that there will be temporary impacts to air quality and noise from equipment utilized, however these will be short-lived. Impacts associated with project implementation will be assessed through applications for local, state and federal permits, as needed.

3.6 Tingue Dam Fish Passage

Environmental consequences

- Beneficial consequences – Construction of the bypass channel will provide passage for a number of diadromous fish species and restore access to 32 miles of habitat above the Tingue Dam. This project complements other dam removal and fish passage projects on the Naugatuck River. Additionally, contaminated soils will be removed from the site and will no longer potentially affect aquatic and terrestrial organisms.
- Adverse consequences – Construction-related impacts to air quality and noise should be anticipated during construction, however, these will be temporary.

Socioeconomic consequences

- Beneficial consequences – The project is located in and near distressed communities and would restore natural resources that will then be accessible to members of these communities. The project has an outreach and education component and will provide additional recreation opportunities as well.
- Adverse consequences – Negative impacts from construction-related traffic should be expected, however, these will be temporary and short-lived.

3.7 McKinney NWR, Great Meadows Unit Marsh Restoration

Environmental consequences

- Beneficial consequences – Marsh restoration will improve ecological functions and habitat quality for wildlife, including state-listed species known to occur on the site (e.g. saltmarsh and seaside sparrow, northern harrier), as well as reduce mosquito production and the occurrence of nonnative invasive species.
- Adverse consequences – State-listed salt marsh pink populations will need to be identified and protected before project implementation. Additionally, the project will need to be conducted outside of the bird nesting season to prevent disturbance to state-listed bird species potentially at the site. Any contaminated soil issues that may arise will need to be addressed.

Socioeconomic consequences

- Beneficial consequences – The varied project practices will return the area to a more natural aesthetic state and provide outreach and education opportunities for the public.
- Adverse consequences – There are no adverse socioeconomic impacts.

3.8 Cumulative Impacts of the Preferred Alternative

A "cumulative impact" is defined in the NEPA regulations (40 CFR 1508.7) as the impact on the environment which results from the incremental impact of the Preferred Alternative when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from a series of individually minor actions that collectively have a significant effect over time.

The past activities at the GE facility in Pittsfield, Massachusetts resulted in the widespread PCB contamination in the Housatonic River. Normal development and human infrastructure (e.g., dams, water diversions, and floodplain infringement) have also placed a burden on the Housatonic River ecosystem.

Extensive remediation efforts have taken place within and adjacent to the most contaminated segments of the Housatonic River in Massachusetts. The U.S. Environmental Protection Agency continues to work with GE to develop remedial activities for contaminated areas not yet addressed. In Connecticut, watershed organizations, land trusts, and environmental groups continue to seek opportunities to improve the habitat in the Housatonic River basin. Stream stocking, land preservation, dam removal, and fish habitat improvements have been implemented in an effort to enhance and restore the habitat function in the river and its tributaries.

Numerous ongoing efforts are underway to improve ecological habitat, riparian function, and recreation in the Housatonic River mainstem, as well as its tributaries. The cumulative impact of the Preferred Alternatives presented in this amendment will be positive. Additional aquatic restoration projects, combined with ongoing aquatic restoration, riparian and floodplain, and recreational resource restoration projects within the Housatonic River watershed, will improve, enhance, and protect the natural environment and will have individual as well as cumulative positive impacts. No negative cumulative impacts have been identified.

4.0 DOCUMENT PREPARERS

The following agencies and individuals have prepared this Draft Amendment.

Sponsoring Agencies: Rick Jacobson, Robin Adamcewicz
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106

Molly Sperduto
U.S. Department of the Interior

Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Ken Finkelstein, PhD
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
1 Congress Street
Boston, MA 02114

5.0 AGENCIES, ORGANIZATIONS, AND PARTIES CONSULTED FOR INFORMATION

In addition to the parties that submitted restoration project proposals, the CT SubCouncil consulted the following agencies, organizations, and parties for information during the preparation of this document.

Connecticut Department of Energy and Environmental Protection
- Bureau of Natural Resources, Wildlife Division
- Bureau of Natural Resources, Inland Fisheries Division
- Bureau of Water Protection and Land Reuse, Inland Water Resources Division
- Bureau of Materials and Waste Management, Remediation Division
- Bureau of Water Protection and Land Reuse, Inland Water Resources Division

National Oceanic and Atmospheric Administration

U.S. Fish and Wildlife Service

6.0 APPENDIX A. Trustee Approvals

Trustee Approval
of the

Draft Amendment
to the
Housatonic River Basin
Final Natural Resources Restoration Plan, Environmental Assessment, and Environmental Impact Evaluation for Connecticut

By the signature below, the Housatonic River Basin, Natural Resources Restoration in Connecticut, Draft Amendment to the previously released Final Restoration Plan and Environmental Assessment is hereby approved by the Connecticut Department of Energy and Environmental Protection. This approval does not extend to the final Amendment. The draft Amendment shall be released for public review and comment for a period commensurate with regulations promulgated under the National Environmental Policy Act and the Connecticut Environmental Policy Act. After consideration of the public comments received, the Amendment may be revised to address such comments.

Approved:

1/18/13

Richard A. Jacobson Date
Natural Resource Trustee Representative
Connecticut Department of Energy and Environmental Protection

Trustee Approval
of the

Draft Amendment
to the
Housatonic River Basin
Final Natural Resources Restoration Plan, Environmental Assessment, and Environmental Impact Evaluation for Connecticut

By the signature below, the Housatonic River Basin, Natural Resources Restoration in Connecticut, Draft Amendment to the previously released Final Restoration Plan and Environmental Assessment is hereby approved by the Department of Commerce/National Oceanic and Atmospheric Administration. This approval does not extend to the final Amendment. The draft Amendment shall be released for public review and comment for a period commensurate with regulations promulgated under the National Environmental Policy Act and the Connecticut Environmental Policy Act. After consideration of the public comments received, the Amendment may be revised to address such comments.

Approved:

10 January 2013

Kenneth Finkelstein, PhD Date
Natural Resource Trustee Representative
National Oceanic and Atmospheric Administration

U.S. Department of the Interior Approval

Draft Amendment
to the
Housatonic River Basin
Final Natural Resources Restoration Plan, Environmental Assessment, and Environmental Impact Evaluation for Connecticut

In accordance with U.S. Department of the Interior (Department) policy regarding documentation for natural resource damage assessment and restoration projects (521 DM 3), the Authorized Official for the Department must demonstrate approval of draft and final Restoration Plans and their associated National Environmental Policy Act documentation, with concurrence from the Department's Office of the Solicitor.

The Authorized Official for the Housatonic River case is the Regional Director for the U.S. Fish and Wildlife Service's Northeast Region.

By the signatures below, the Draft Amendment to the final Restoration Plan/Environmental Assessment is hereby approved.

Approved:		Concurred:	
14 Jan 2013		1/14/2013	
Wendi Weber	Date	Mark Barash	Date
Acting Regional Director		Senior Attorney	
Northeast Region		Northeast Region	
U.S. Fish and Wildlife Service		Office of the Solicitor	