New Hampshire
Department of Environmental Services
Wetlands Bureau Mitigation Program

AQUATIC RESOURCE MITIGATION FUND

Upper Connecticut River Watershed
Site Selection Committee
Recommendations

June 2010

INTRODUCTION

The New Hampshire Department of Environmental Services (DES) Aquatic Resource Mitigation (ARM) Fund was established by law in August, 2006 as a mitigation option for certain projects not able to provide other forms of mitigation. The ARM Fund Site Selection Committee (Committee) was set up to provide a mechanism for reviewing, evaluating, and selecting wetland restoration, upland preservation, wetland creation, and other aquatic resource improvement proposals. According to the law, the projects determined to be appropriate for receipt of ARM Fund monies are subject to approval by the US Army Corps of Engineers (ACE) and the NH Wetlands Council (Council).

The Committee is charged with identifying proposals to be funded by selecting high priority projects that most effectively compensate for the loss of functions and values in the watershed. The Council is charged with approving disbursements of the ARM Fund based on recommendations provided by the Committee per RSA 482-A:29.

On September 28, 2009 DES announced the availability of $148,000 with a deadline for proposal submittal of March 26, 2010 for the watershed. The funds came from two permitted projects located in the towns of Pittsburg and Colebrook (See Attachment A). These permitted projects impacted the following functions: wildlife habitat, groundwater discharge and recharge, flood storage and sediment/toxicant retention. Four applications were received in response to the solicitation and are summarized below.

A. Project Proponent: The Nature Conservancy
Project Title: Potter Farm Land Protection and Wetland Restoration, Northumberland

This project proposes to protect and restore floodplain forests, maintain agricultural land uses, and protect uplands and rivershore connectivity. The project includes permanent land protection of 326 acres of land which is an entire ridgeline-to-rivershore swath. These uplands are part of the Conservancy's "Kilkenny Matrix Forest Block", comprising 119,600 acres of unfragmented forest area that represents one of The Conservancy's top priorities for forest conservation. This forest area also corresponds with the NH Wildlife Action Plan unfragmented forest blocks. The Potter Farm, located on Route 3 in Northumberland, is adjacent to more than 350 acres of WAP-modeled floodplain forest habitat. Multiple additional patches of intact floodplain forest occur throughout Maidstone Bends, making this area one of the most productive river reaches for this wetland type.

The project will maintain natural meander patterns while enhancing riparian buffer vegetation in the existing low terrace fields over the long term, and restoring and enhancing floodplain forest vegetation in the short-term. The ARM proposal includes a request to develop and implement a pilot restoration on the 75 acres of low terrace field comprised of 16 acres of wetlands and 59 acres of hayfield. The primary restoration goal at Potter Farm is the protection and enhancement of floodplain forest wetlands. The restoration activities proposed within the pilot phase focuses on restoring or enhancing floodplain forest vegetation. A total of 33 acres of wetlands have been identified for restoration through the short and long-term project goals. All plans include maintaining current hayfield management on the majority of current field acreage.

Pilot Restoration (ARM Fund Request)

1. Restore floodplain forest vegetation to enhance 3.7 acres at Wetland #2 where silver and red maples were harvested for fire wood. This will require two Conservancy staff and approximately 15 volunteers to plant floodplain tree saplings (200 stems/acre) using hoes, tree tubes, and support stakes. Silver and red maple saplings will be planted to retain the dominant tree species composition, but other native species may be planted including hackberry, butternut, black ash, and boxelder. In addition, in collaboration with other Conservancy, agency, and academic experts, it is proposed to re-introduce American elms to these floodplain forest areas, with the long-term vision of utilizing Dutch-elm Disease tolerant trees. American elm used to be

a dominant tree in floodplains, and the ecological processes and longevity of floodplain species composition and structure could be enhanced through elm re-introduction.

2. Enhance two wetland patches (10.4 acres) with additional floodplain tree saplings (50 stems/acre) with similar methods. These patches have been lightly harvested for firewood (Wetland #5), or appear to be abandoned from agriculture (north of Wetland #3) and require active management to restore forest structure.

Long-term Restoration (Future funding requests)

1. Over the long term, restoration efforts will be increased by retiring portions of the hayfield along the northern and western-most fields along the river's edge, and restoring floodplain forest species composition and structure. This includes future retirement of approximately 9.5 acres of hayfields along the banks of the Upper Ammonoosuc River. These field locations have evidence of riverbank erosion, sediment deposition, point bar formation, and current floodplain vegetation. Restoring floodplain vegetation and allowing for channel migration at this location would enhance the long-term ecological integrity, improve buffers, and increase floodplain connectivity to the north across the Upper Ammonoosuc confluence. These activities will require additional resources and funding, which we will seek in future years through public and private sources.

2. As more is learned about the genetics of Dutch-Elm Disease tolerance and resistance in American elms, the proposal intends to accelerate their re-introduction to this site. Following the experience and lessons-learned from American elm re-introduction efforts in Vermont (just upstream on the Connecticut River in Maidstone, Vermont), it is anticipated that advances elm restoration in floodplain forest patches throughout the Wetlands Management Area will occur.

The Potter Farm property also includes 251 acres of upland south and east of Route 3 and extends to the ridgeline of Cape Horn, abutting the northern extent of Cape Horn State Forest. Goals include upland habitat protection, agricultural management, and upland connectivity with Cape Horn State Forest.

Grant amount requested:	$148,000
Amount of matching funds secured:	$233,702
Total project costs:	$381,702

B. Project Proponent: New Hampshire Lakes Association
Project Title: NH LAKES Lake Conservation Corps Program: Restoring the Shore for Community and Habitat Enhancement, Colebrook

NH LAKES, through the Lake Conservation Corps, proposes to employ local youth and a teacher to construct and showcase storm water and water quality best management practices on 2,380 linear feet of river frontage. The parcel is owned by the Town and the proposed restoration focuses primarily on reducing the amount of sediment from erosion along the bank of the river. This parcel serves as the source of the Town of Colebrook drinking water supply. The shoreline and 50-foot waterfront buffer zone along most of the frontage is partially devoid of natural vegetation with bare, compacted soils and sandy areas which do not provide for significant wildlife habitat or storm water infiltration. The area is zoned commercial and one existing building is in relatively close proximity to the river. Over a three year span, the LCC program plans to construct vegetated buffers and swales, rain gardens and other storm water management and water quality BMP's that are designed to slow down and infiltrate surface water into the ground within disturbed/degraded areas.

Grant amount requested:	$82,138
Amount of matching funds proposed:	$47,749
Total project costs:	$129,887

C. Project Proponent: Jefferson Conservation Commission
Project Title: Stag Hollow Brook Restoration Project, Jefferson

The Town of Jefferson Conservation Commission seeks funds to restore channel stability and ecological function to a 1,500 linear foot reach of a severely degraded portion of Stag Hollow Brook. Natural channel design principles are proposed to improve aquatic organism connectivity, habitat, and water quality.

During a large flow in summer 2002, the channel of Stag Hollow Brook along Route 115 was abandoned. Floodwaters broke through a berm along the west bank and a large gravel deposit was formed where the flow spread out over the adjacent field. Current flow is wide and shallow with no well-defined banks. The open field through which the wide and shallow channel now passes leads to warm water temperatures that also impacts the downstream Israel River. Poor channel definition also limits the physical habitat complexity along the channel with limited pool development and substrate particle size distribution. The project proposes to divert most of the flow into the side channel west of the existing channel. Without restoration, flow is likely to remain in the currently active channel where habitat and water quality degradation are likely to persist for several years if not decades.

Grant amount requested:	$105,000
Amount of matching funds proposed:	$43,000
Amount of matching funds secured:	$157,800 (potential in 2011, DES 319 grant funds)
Total project costs:	$306,000

D. Project Proponent: Town of Northumberland
Project Title: Northumberland Cemetery Riverbank Stabilization

This project proposes to stop erosion of the riverbank that borders the town cemetery in order to stop the chance of human remains from falling into the river. The plan is to strategically place engineered log jams and steel pilings along parts of the river and bank at the "Low Flow" line, fill behind them to assist with the anchorage and plant fast growing trees with both deep and surface root systems.

The breaching of the old Wyoming Dam three miles downstream of the cemetery in the early 1970's accelerated the erosion and slumping of this approximately 700' section of riverbank. As a result of a fluvial geomorphology assessment performed in 2004 along 85 miles of the northern Connecticut River and also part of a study done in 2005 by the Connecticut River Joint Commission, the suggestion of engineered log jams to stabilize the bank at the Northumberland Cemetery was presented. Site surveying will be done to create a base map and for hydraulic modeling, data will be drafted to create 2-foot topography and cross sections. There will be modeling done to determine changes in water surface elevations, spacing and size of logjams as well as an assessment performed of material properties and potential mass failure risk. A project engineer will review data, design drawings and specifications, perform a stability analysis, and communicate such with local officials.

Grant amount requested:	$160,295.28
Amount of matching funds proposed:	$72,149.39
Total project costs:	$232,444.67

RESULTS OF ARM FUND SITE SELECTION COMMITTEE REVIEW

The Committee and Department visited the sites and on May 26 the Committee convened to evaluate and rank the applications with the findings noted below. The Committee recommends full funding of The Potter Farm Land Protection and Wetlands Restoration project. The Committee noted that the selected project provides the greatest potential to replace or protect specific wetland functions and values lost by the impacts in the Upper Connecticut River HUC 8 watershed. Location maps of the four parcels are included in Attachment B.

1st. The Potter Farm Land Protection and Wetland Restoration, Northumberland

A. The Potter Farm project proposes a combination of restoration and protection of floodplain forest communities which are noted as unique and important in the region. A site conservation plan for the Maidstone Bends was completed in 2008 that highlighted priority floodplain forests on both sides of the River, including to the Potter Farm fields.
B. The project goals meet the intent of the ARM Fund program specifically wetland restoration, upland habitat protection adjacent to high value wetlands, agricultural management on the majority of productive farm floodplain soils, and connectivity with existing conservation lands.
C. The project far exceeds the compensation requirement for this watershed by the long-term wetland restoration of 33 acres of low terrace field, and protecting the 326 acre property, resulting in the connectivity of uplands with Cape Horn State Forest. In addition, the parcel is part of the Conservancy's "Kilkenny Matrix Forest Block", comprising 119,600 acres of unfragmented forest area that represents a top priority for forest conservation.
D. There is a diversity of aquatic habitats, floodplain systems, and documented Natural Heritage exemplary natural communities which will be permanently protected through a conservation easement.
E. Key functions to be provided by this project include ecological integrity, wildlife and fish habitat, sediment trapping, nutrient attenuation, and noteworthiness for its connection to and proposed protection of the NH State Designated Connecticut River.
F. There are multiple Natural Heritage records in the uplands of Potter Farm as well as river based occurrences of rare and exemplary natural communities.
G. The floodplain forests to be restored and protected are an ecosystem type recognized as one of the priority habitats in the New Hampshire Wildlife Action Plan. Approximately half of the lower terrace is ranked as a top-ranked, Tier 1 habitat while the remaining half is identified as Tier 2.
H. The project offers the best opportunity for restoration of the functions lost in the watershed from the projects that generated the funds and additional functions important in the Upper Connecticut River watershed.

2nd. New Hampshire Lakes Association, Lake Conservation Corps Program: Restoring the Shore for Community and Habitat Enhancement, Colebrook

A. The project is proposed within an existing disturbed river bank area along the Connecticut River. The area to be improved varies in width with a very limited buffer area on the central portion of the project.
B. The parcels to receive stormwater and water quality management practices are part of the Colebrook Development Corp. and will remain zoned as commercial.
C. No additional area is proposed to be protected and there is the potential for future construction on the lots.
D. The project proposes enhancement to riverine habitat that provides some but not all of the functions that were lost due to the projects that paid into the ARM Fund.

3rd. Stag Hollow Brook Restoration Project, Jefferson

A. A defined channel may eventually develop along the entire length of the new channel that could be enhanced naturally by limiting activities on the site and in the wetland areas that are attempting to naturally reestablish.
B. A well developed stable channel configuration will evolve slowly and is showing evidence of stabilizing at the time of the site visit.
C. The project has potential to be funded by DES s319 grant funds which may be a more appropriate funding source.

D. Long-term protection measures on the work site and surrounding uplands would be necessary and this was not included in the proposal or budget.
E. The proposal is limited in terms of replacing the functions lost from the projects that paid into the fund.

4th. Northumberland Cemetary Riverbank Stabilization, Northumberland

A. The use of engineered log jams in this location requires construction of a road to access the work area which may cause greater bank destabilization and failure due to the steepness and height of the bank.
B. The use of engineered log jams is experimental and whether they are an appropriate solution in this area is questionable.
C. There is a limited natural wooded buffer at this location and no opportunity to increase the buffer for habitat improvement due to the existing cemetery.
D. The proposal is limited in terms of replacing the functions lost from the projects that paid into the fund.
E. The project may be supported by funds available through a program provided by the Army Corps of Engineers, at http://www.nae.usace.army.mil/pservices/shore14.htm

ATTACHMENT A.
UPPER CONNECTICUT RIVER WATERSHED ARM FUND PAYMENTS

PERMIT #	LOCATION-TOWN	PROJECT TYPE	COWARDIN CLASS	PRIMARY F/V's	OTHER ISSUES	WETLAND LOSS	PAYMENT AMOUNT	DEPOSIT DATE
2006-516	Pittsburg	After the fact subdivision on 245 acres	R4SB3, PFO1B,PFO1 /SS1B, R3UB1,PFO1/ EM1B	Wildlife habitat, Uniqueness as it drains to desig. CT River	Headwaters to Perry Brook	43,452	103,226.00	8/20/2007
2005-2313	Colebrook	DOT bridge replacement, roadway improvement	PEM1E, PSS1E, PFO1E, PFO4E, R3UB1H	Floodflow alteration, wildlife and fish habitat, flood storage, sed/nutrient filtering	Land preser-vation also part of mitigation	22,075	52,933.59	2/20/2009
TOTALS						**65,527**	**156,159.59**	

ATTACHMENT B

POTTER FARM, NORTHUMBERLAND PROJECT

NH LAKES, COLEBROOK PROJECT

STAG HOLLOW BROOK RESTORATION, JEFFERSON

NORTHUMBERLAND CEMETARY STABILIZATION PROJECT