Hathaway Brook Dam Removal and Stream Restoration in conjunction with the NFHAP and MA EBTJV State Conservation Strategy

Massachusetts, Berkshire County, Dalton

1st Congressional District

EBTJV / NFHAP Funding Requested: $ 50,000

Total Project Cost: $850,000

Total Federal Matching: $50,000 (EBTJV Request)

Total Non-Federal Matching: $800,000

Type of Project: dam removal, fish passage, stream restoration

APPLICANT

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Sponsoring Fish and Wildlife Service Fisheries Office

Fish and Wildlife Service Office:	Central New England Fishery Resources Complex
Project Officer:	Martha Naley
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Date Submitted: October 1, 2009

I. PROJECT DESCRIPTION, SCOPE OF WORK, AND PARTNER INFORMATION

A. Project Description and Scope of Work (not to exceed 500 words)
The City of Pittsfield is seeking to restore aquatic biological resource habitat within Hathaway Brook by removing Upper Hathaway Dam and reestablishing stream connectivity. Hathaway Brook is a tributary to Sackett Brook, which in turn is a tributary to the Housatonic River. The project site has two dams within the City owned parcel that are no longer utilized as originally intended. The deteriorating Upper Dam impounds Hathaway Reservoir and is part of a water supply for the City that is no longer in service. The City is required by MassDEP to remove Lower Hathaway Dam, located 250 feet downstream of Upper Dam, as a compensatory mitigation project for unavoidable wetland impacts associated with the repair of Ashley Lake Dam (located south of Hathaway Brook, see map in Section II. No NFHAP/EBTJV funds are being requested for Lower Dam removal. Although not required by MassDEP, the City is proposing to remove Upper Hathaway Dam and its appurtenant structures as a separate project (the subject of this application package). The dam and Hathaway Reservoir, built in 1908, no longer function as originally intended. Since its use as a water supply was abandoned in the late 1950s, the dam has severely deteriorated and currently presents a potential hazard to pedestrians and wildlife that encounter it. Brook trout *(Salvelinus fontinalis)* have been observed in Hathaway Reservoir; however, habitat value has diminished in the vicinity of the Hathaway Reservoir impoundment and the stream reach between the Lower and Upper Dams.

The primary goal of the Upper Hathaway Dam Removal Project is to restore natural stream conditions and stream connectivity within Hathaway Brook, thereby enhancing habitat value for existing aquatic species and allowing migration from the Housatonic River to the upper reaches of the brook. The objectives of this project are to:

- Remove a barrier to approximately 3,000 feet of stream habitat for eastern brook trout and restore 4,400 square feet of the Hathaway Brook stream channel allowing for downstream migration for fish species and other aquatic organisms;
- Recreate pre-dam topography in upland areas and the historic stream channel;
- Reestablish continuous flow and natural sediment transport regime, and restore river geomorphic processes within channel, to that which currently exist upstream of the existing impoundment and downstream of the Lower Dam; and
- To expand and improve brook trout habitat in a reduced watershed in conjunction with the EBTJV and state strategies.

Project activities include: removal of the Upper Dam wall, removal of a portion of the impounded sediment, re-grading, and reestablishment of streambed characteristics.

B. Partner Information (not to exceed 100 words)

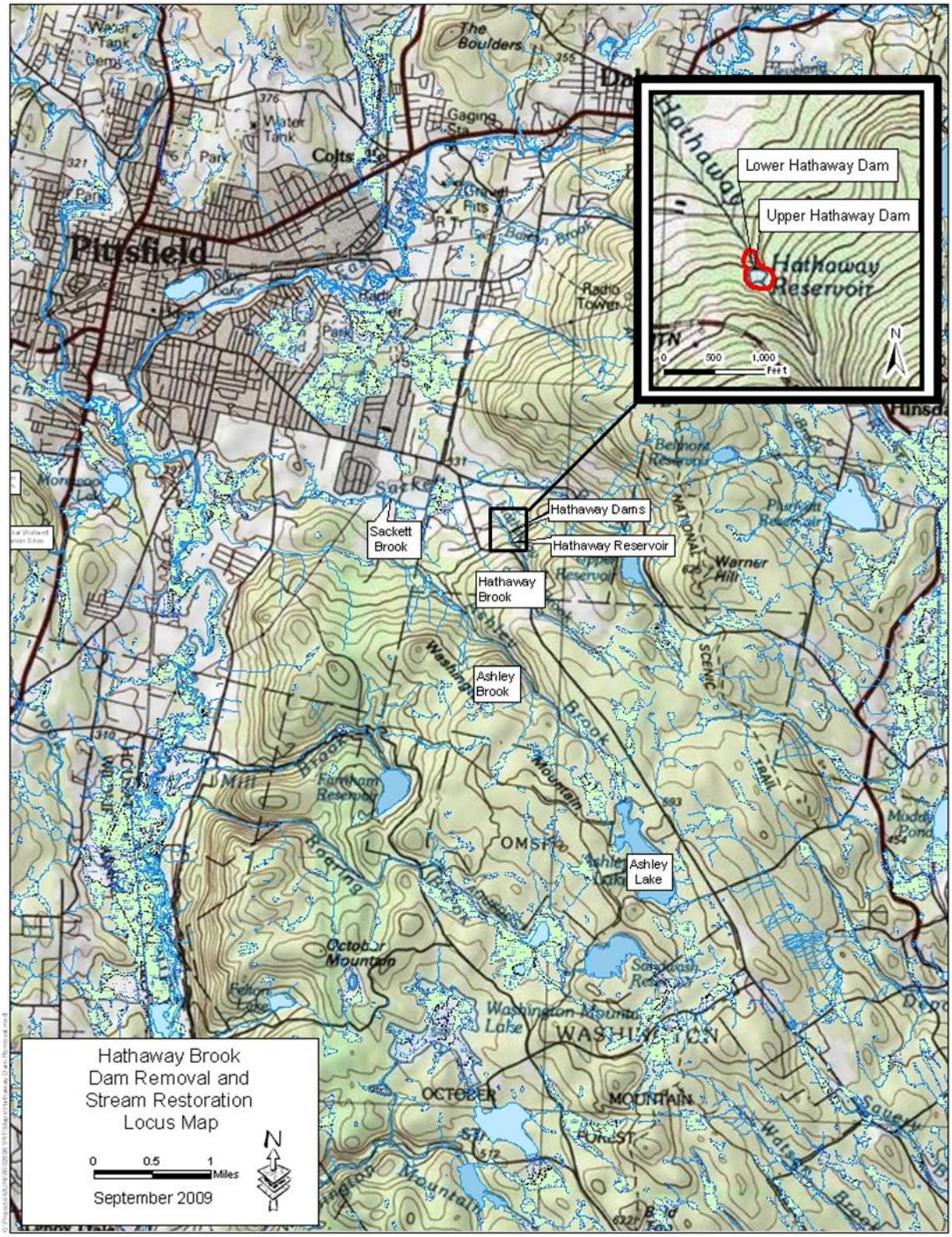
Partner Name	Contribution In-Kind	Contribution Cash	Federal or Non- Federal	Partner Category	Role of Partner
NFHAP-EBTJV		50,000	Federal	Federal Agency	Construction
City of Pittsfield		300,000	Non-Federal	Local Gov	Planning, Construction, Monitoring
Housatonic Natural Resources Damages Fund		500,000	State	State Agency	Construction, Monitoring

C. Project Timeline

- Work will be conducted in late summer to early fall to take advantage of low flow conditions. Construction activities will be initiated by August 31, 2010 to be consistent with the schedule for the Lower Dam removal project. The actual start date for construction will be dependent on the time required to obtain the environmental permits for the project and the environmental constraints that could be placed on the project.
- Although this proposal focuses on the removal of Upper Hathaway Dam, the removal of Lower Hathaway Dam is anticipated to occur simultaneously.

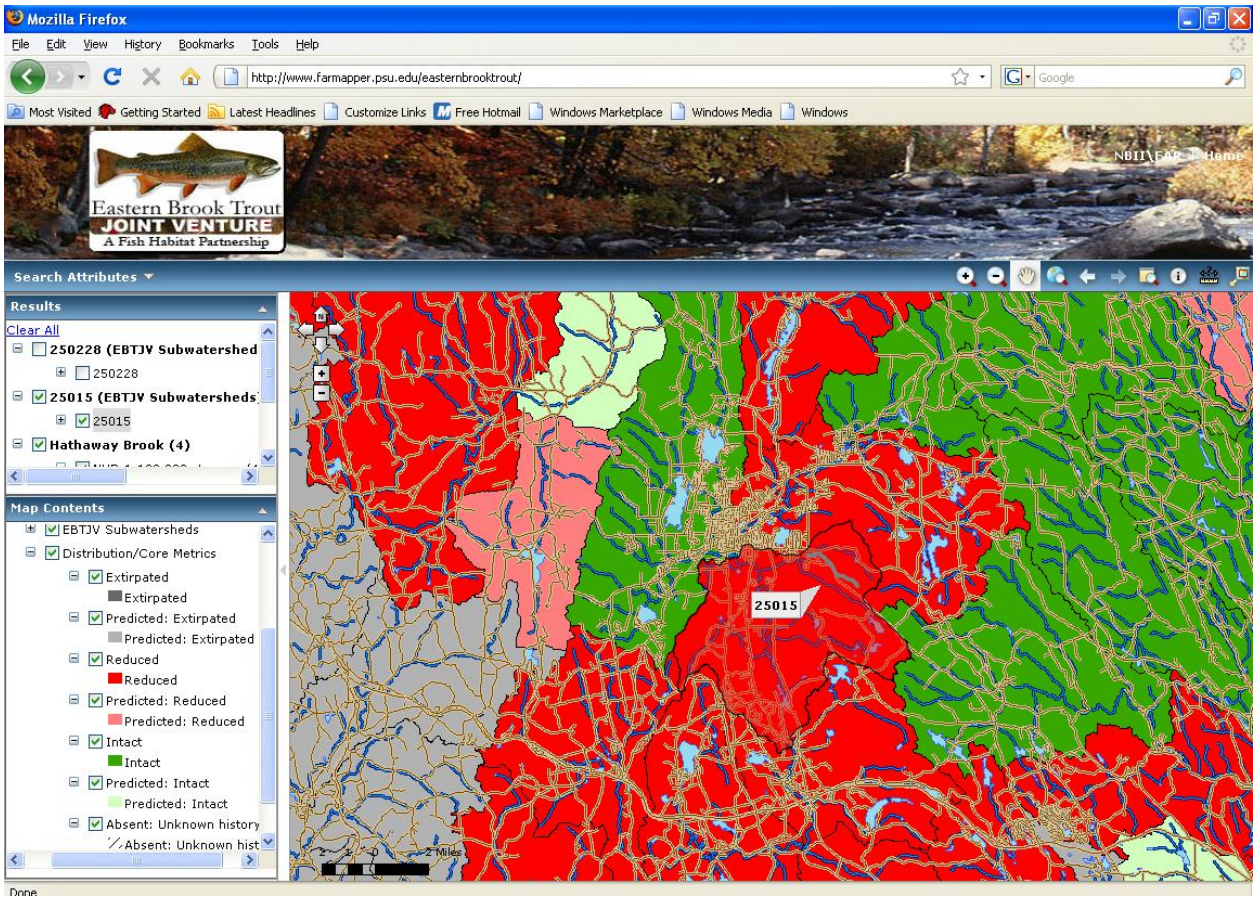
Activity	Pre-App. (FY 2009) July 1, 2008 to June 30, 2009	Yr1 (FY2010) July 1, 2009 to June 30, 2010	Yr 2 (FY 2011) July 1, 2010 to June 30, 2011	Yr 3 (FY 2012) July 1, 2011 to June 30, 2012	Yr 4 (FY 2013) July 1, 2012 to June 30, 2013	Yr 5 (FY 2014) July 1, 2013 to June 30, 2014	Yr 6 (FY 2015) July 1, 2014 to June 30, 2015
1. Dam Removal Feasibility Study							
2. Final Engineering							
3. Permitting							
4. Dam Removal			NFHAP funds requested				
5. Sediment Removal							
6. Stream Restoration							
7. Construction Monitoring							
8. Pre-/Post-Restoration Monitoring							

II. MAP OF PROJECT AREA (one only)



Coordinates:
Decimal degree longitude: (NAD-1983) 42.420447 N
Decimal degree latitude: (NAD-1983) -73.185089 W

HUC6 level watershed (http://128.118.47.58/EBTJV/ebjtv2.html): 25015



III. PHOTOGRAPH(S) OF PROJECT AREA (no more than 2, please provide credits and attach photo release forms)

Sediment has accumulated in Hathaway Reservoir upstream of the Upper Hathaway Dam. This impoundment contributes to the degraded fish habitat and the dam is an obstruction to fish passage (Photo by: Tom Touchet, AECOM)

Upstream of Upper Hathaway Dam, the Hathaway Brook provides a habitat amenable to brook trout including natural flow patterns. Brook Trout prefer a rocky or cobbly substrate characteristic of Hathaway Brook (Photo by: Tom Touchet, AECOM)

IV. PROJECT BUDGET

Activity	NFHAP Request	Non-Fed. Contribution	Federal Contribution	Total	Acres/ miles Affected
Feasibility Study/Concept Design		$65,000		$65,000	22,500 ft^2
Final Design and Permitting		$60,000		$60,000	22,500 ft^2
Lower Dam Removal Construction*		$140,000*		$140,000*	22,500 ft^2
Upper Dam Removal Construction	$50,000	$450,000		$500,000	22,500 ft^2
Engineering Services During Construction		$40,000		$40,000	22,500 ft^2
Long-Term Monitoring		$45,000		$45,000	22,500 ft^2
Total	$50,000	$800,000		$850,000	22,500 ft^2

***Part of mitigation for Ashley Lake dam repair project.**

V. EVALUATION QUESTIONS (4 pages maximum)

A. Conservation of Sustainable Brook Trout Populations:

As mentioned in the Massachusetts Eastern Brook Trout Conservation Strategies (MA EBTCS) (2007), dams on small streams cause several impacts to aquatic habitats including creating unstable habitat and reducing or preventing flow and transfer of energy, sediments and nutrients. Furthermore, brook trout are susceptible to degradation of water quality which is often times a result of the impounded waters exposure to sunlight which increases temperatures that are conducive to algal growth. The proposed project contributes to the goals of the MA EBTCS, EBTJV Conservation Strategies (2008) by removing a barrier to brook trout habitat upstream of Hathaway Reservoir as well as improving brook trout habitat in the area of the current reservoir. The Massachusetts Riverways Program (2007) also supports dam removal projects throughout Massachusetts for streams with dams that no longer function as originally intended. In addition, the 2005 Massachusetts Comprehensive Wildlife Conservation Strategy lists brook trout as a species of greatest conservation need in small streams.

The Upper Hathaway dam and Hathaway Reservoir, built in 1908, no longer function as originally intended. Since its use as a water supply was abandoned in the late 1950s, the dam has severely deteriorated and currently presents a potential hazard to pedestrians and wildlife that encounter it. Brook trout *(Salvelinus fontinalis)* have been observed in Hathaway Reservoir; however, habitat value has diminished in the vicinity of the Hathaway Reservoir impoundment. The proposed project objectives are to: remove a barrier to approximately 3,000 feet of stream habitat and restore 4,400 square feet of stream to reestablish stream connectivity within Hathaway Brook that is amenable to brook trout and other aquatic organisms; recreate pre-dam topography in upland areas and the historic stream channel; reestablish continuous flow and natural sediment transport regime, and restore river geomorphic processes within the channel, to that which currently exist upstream of the existing impoundment and downstream of the Lower Dam.

B. Threatened and Endangered Species and Species of Conservation or Management Concern:

Project activities are in alignment with EBTJV and Massachusetts EBTJV state conservation strategies implemented to conserve and improve brook trout habitat. As indicated in the letter of support from the local U.S. Fish and Wildlife Service Sponsoring office, "the primary target species, eastern brook trout, is a Federal trust species and one of particular importance to the U.S. Fish and Wildlife Service' (Attached Letter of Support). In addition, the Massachusetts Eastern Brook Trout Conservation Strategy states that coldwater habitat is shared by several other species besides brook trout. Slimy sculpin, longnose sucker, Atlantic salmon, rainbow and brown trout can all be found within some of the same streams as brook trout. In the western part of the state, brook trout typically coexist with slimy sculpin and, on rare occasion, longnose sucker. This species of sucker is listed as a species of special concern under our State Endangered Species Act and occurs in low abundance with brook trout (2007). Although Brook Trout was the only species observed in Hathaway Brook during site investigations in 2008 and, it is possible that other species may benefit from the restored stream continuity and habitat resulting from the dam removal project.

C. Project Benefits:

The status of the brook trout population in the Housatonic watershed, subwatershed 25015, is reduced with an EBJTV priority ranking of 0.34. Hathaway Brook is a tributary to the Sackett Brook which in turn is a tributary to the Housatonic River, located within the adjacent watershed, 25012. The status of the adjacent subwatershed is intact; therefore, the proposed project will contribute to an increase in existing habitat and restore tributary stream habitats

Removal of Upper Hathaway Dam (the subject of this application package), in addition to the planned removal of Lower Hathaway Dam, would result in immediate benefits. Both the Massachusetts Division of Fisheries and Wildlife and the Riverways Program support the removal of Upper Hathaway Dam in conjunction with Lower Hathaway Dam to improve stream connectivity within the sub-watershed benefiting the native fluvial fishes (see "Letters of Support and Agency Correspondence" attachment). Removal of Upper Hathaway Dam will result in the following natural resource benefits:

> *Surface Water*: Dam removal and stream restoration will positively impact water quality by: reducing water temperatures, establishing natural dissolved oxygen levels, establishing more natural base flows and improving water and river bottom sediment quality.
>
> *Biological Resources*: Dam removal will positively impact fish, invertebrates, amphibians, and other wildlife by establishing continuity of aquatic habitat. Establishment of a natural river bank will also improve canopy conditions, enhance wildlife migration along the river corridor and ameliorate water temperature conditions.
>
> *Sediments*: Stream restoration will improve general biological function. Dam removal reestablishes a natural sediment transport regime and restores natural river geomorphic processes.

Hathaway Brook upstream and downstream of the two dams includes both pool and riffle habitats, with major habitat features including boulders and very large cobbles. On average, water depths were observed to range from a few inches in riffles to 12 inches in some of the pools during site investigations conducted in October 2008 and February 2009. Existing banks in this area are extremely steep, with bedrock outcroppings evident throughout the area and little vegetation along the banks below bankfull indicators.

The desired future condition for Hathaway Brook is a stream with a contiguous, gradual slope passable by brook trout and other fish species. It is anticipated that under future conditions, continuous flow in Hathaway Brook achieved as a result of removal of both dams (the removal of

Upper Hathaway Dam is the subject of this proposal package) will serve to reestablish natural sediment transport and geomorphic processes in this reach similar to that which currently exists upstream and downstream of the dams.

Excavated sediment on-site will be used to fill an abandoned channel upstream of the Upper Dam enhancing upland habitat. The bottom of the stream channel will be lined with cobbles after grading is complete to create a streambed amenable to brook trout. Post-grading bank treatment will similarly include cobbles and boulders to stabilize stream banks.

Plantings will contain only native and indigenous plant materials to the region, including eastern hemlock saplings and American beech saplings. Future conditions will achieve canopy vegetation similar to that which currently exists in other locations along Hathaway Brook.

D. Endurance of Benefits:

Removal of dams and restoration of the stream habitat (using natural channel design techniques) result in immediate and permanent improvements in the river ecology. Currently, State and Federal laws protect streams and riparian habitat from future degradation. Both the Massachusetts Brook Trout Conservation Strategies and the Massachusetts Riverways Program acknowledge the impacts that dams have on small stream ecosystems. The Riverways Program advocates the removal of dams that are no longer functioning as originally intended. Specifically, the dams on Hathaway Brook act as barriers to fish passage and restrict natural flow patterns. Dams typically create habitats preferable to pond species rather than fluvial species by impounding water upstream. The impoundment eliminates the movement of silt and nutrients downstream and water quality can be significantly reduced. Exposure to sunlight increases water temperature to a level that is conducive to algal growth. The overall approach for this project is to address these causes of watershed degradation by restoring stream connectivity and enhancing habitat value within Hathaway Brook by removing Upper Hathaway Dam in conjunction with the removal of Lower Hathaway Dam.

Brook trout generally prefer a rocky or cobbly substrate relatively free of silt and sediment. Removing the dams in Hathaway Brook will remove an impediment to flow which causes sediment deposition and impoundment. Removing Upper Hathaway Dam will result in the removal of impounded sediment, and with continuous flow, encourage natural sediment dynamic processes and nutrients to flow downstream improving conditions for brook trout.

The stream and habitat restoration practices include post-grading bank treatment with cobbles and boulders to stabilize banks. Islands within Hathaway Brook that may be disturbed will be seeded with an erosion control seed mix, covered with an erosion control blanket, and planted with materials native to the region to provide short-term stabilization and erosion control, and provide valuable long-term riparian habitat. In addition, the stream restoration will include the creation of a pool habitat area to encourage brook trout spawning, which will contribute to brook trout population growth and long-term sustainability of aquatic resources in the brook.

The percentage of the watershed that will be protected in perpetuity above the proposed project is approximately 10%. In addition, there is no stocking that occurs at the project site or within the watershed.

E. Management Assets:

Cross-sections and longitudinal profiles have been collected and pre- and post-hydraulic conditions have been modeled. Future hydrologic/hydraulic conditions and the storage-depth relationship for the current impoundment upstream of the Upper Hathaway Dam was simulated in the HydroCAD model to predict any adverse changes to the downstream flow conditions as a result of the removal of the dam. In addition, anticipated flow velocities and water levels achieved after the dam removal for cross sections at six locations along the brook were simulated using HEC-RAS, a river modeling software program developed at the Hydrologic Engineering Center (HEC) for the Army Corps of Engineers.

Simulations include conditions during a 2-year storm and 100-year storm. Project plans and construction activities are based on the model results, studies and evaluations to eliminate uncertainties, and minimize unexpected adverse impacts.

Pre and post dam removal monitoring would include a fish monitoring study implemented through fish sampling via a backpack electrofishing unit within the impoundment, in an upstream stream reach, and in a downstream reach to assess fish usage of Hathaway Brook prior to dam removal as well as after removal. The fish monitoring would include using a backpack electrofishing unit and the three-pass removal method. This monitoring will be completed in fall 2009 to document pre-dam removal conditions and will also be conducted post construction in FY 2012 and FY2013. Approximately 20% of the available fish habitat upstream of the current impoundment could be sampled, as well as a similar area of habitat downstream. Fish collected would be temporarily stored in buckets on-site while data is gathered regarding their species, weight, and length; all individuals would then be returned to the stream. Collected data would be compiled and analyzed to assess population densities and size structure both before and after dam removal. There is no long-term maintenance other than the monitoring planned for the project.

There will be positive impacts to educational opportunities with this project. Locally, educators may wish to use the site as a component to their environmental curriculum with the topic of river restoration. More importantly, this restoration project will provide an opportunity for technology transfer to other communities who are exploring dam removal and river restoration. Through consultation and coordination with MA Riverways Program, this restoration project will constitute a case study and will be well publicized.

All construction methods for stream and habitat restoration within the project area are implemented for the purpose of long-term effectiveness and sustainability. Restoring continuity in the riverine system will benefit fish and other aquatic species that are currently restricted from these additional habitat areas.

F. Other Special Considerations:

The City of Pittsfield has recognized the additional benefits that will result from removing the Upper Dam in conjunction with removal of the Lower Dam that is required for mitigation. The project is a unique opportunity to restore additional lengths of stream and provide full benefits of stream connectivity. The benefits resulting from removal of Upper Dam in addition to the required removal of the Lower Dam as mitigation far exceed any benefits gained from only removing the Lower Dam.

AECOM Water is the environmental consultant for the City of Pittsfield with regards to the Hathway Dam Removal and Stream Restoration Project. AECOM has assisted in aquiring permits for the Lower Dam removal as mitigation for the Ashley Lake Dam repair Project. AECOM has completed 90% design drawings for the removal of the Upper Hathaway Dam that have been reviewed by the U.S. Army Corps of Engineers and MA Riverways Program. AECOM has been submitting permit applications for the Upper Hathaway Dam Removal and anticipates obtaining the permits by late spring 2010. Construction is anticipated to begin in August 2010. Applications include detailed project descriptions, additional maps, site plans and other technical information that can be provided to the EBJTV proposal reviewers if requested.

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Doug.gove@aecom.com

G. Supporting Documentation and Management Plans:

Conservation Strategy/Habitat Work Group Eastern Brook Trout Joint Venture, 2008. Conserving Eastern Brook Trout: Action Strategies. August. (http://www.easternbrooktrout.org/docs/EBTJV_Conservation_Strategy_July_08.pdf)

MA Division of Fisheries and Wildlife (MA DFW), 2007. Massachusetts Eastern Brook Trout Conservation Strategies. January. (http://www.easternbrooktrout.org/docs/EBTJV_Massachusetts_CS.pdf)

Massachusetts Riverways Program, 2007. Dam Removal in Massachusetts, A Guide for Project Proponents, MA Department of Fish and Game. December. (http://www.mass.gov/dfwele/river/pdf/eea_dam_removal_guidance%5B1%5D.pdf)

MA DFW, Department of Fish and Game, and the Executive Office of Environmental Affairs, revised 2006. 2005 Massachusetts Comprehensive Wildlife Conservation Strategy. September. (http://www.mass.gov/dfwele/dfw/habitat/cwcs/pdf/mass_cwcs_final.pdf).