

I. COVER PAGE

A. General Information

Project Title: Implementing the NFHAP and EBTJV to enhance habitat in the Kettle Creek watershed in northern PA

NFHAP Funding Requested: \$45,000

Project Location: Upper Kettle Creek watershed and tributaries - Elk Township, Tioga County; Abbott Township, Potter County; Leidy Township, Clinton County

Congressional District: 5th District of Pennsylvania

Applicant Organization: Pennsylvania Fish and Boat Commission
Division of Habitat Management
450 Robinson Lane
Bellefonte, PA 16823

Project Officer: Jason Detar

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Submission Date: 11 October 2006

B. Sponsoring Fish and Wildlife Service Fisheries Office

Fish and Wildlife Service Office: Northeast Fishery Center
U.S. Fish and Wildlife Service
Northeast Fishery Center
P.O. Box 75
Lamar, PA 16848

Project Officer: Meredith Bartron

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II. EXECUTIVE SUMMARY

Project Summary

Field Priority (information provided by Fish and Wildlife Service sponsoring office):

Title of the Project: Implementing the NFHAP and EBTJV to enhance habitat in the Kettle Creek watershed in northern PA

Proposed Accomplishment: The project is an on-the-ground application of the NFHAP and EBTJV. It will focus on enhancing adult brook trout habitat using devices that will improve overhead cover and water depth, while reducing erosion of stream banks in heavily eroded areas. Riparian plantings may also be used. The project represents a partnership of federal, state, and county agencies and local sportsman groups. Brook trout populations inhabiting the treatment reach and a control reach will be monitored for comparison.

Description of Project

Importance of the project to the resource: The project is located in the Kettle Creek watershed in northcentral PA. The upper Kettle Creek watershed is managed under no-harvest angling regulations for brook trout and is a popular destination for wild trout anglers. The project will focus on enhancing habitat and stabilizing eroding banks to maintain the exceptional value of the system.

Problem and the specific cause: The main problem is the lack of adult brook trout habitat -specifically, long stream sections dominated by shallow riffle/run habitat with minimal overhead cover. The specific cause of the problem likely stems from severe, clear cut logging and splash-damming in the early 1900's that severely altered the morphology of these streams.

Project objectives: There are 5 objectives to the project: 1) form long-term partnerships that will play a vital role in conserving and enhancing brook trout in PA, 2) enhance adult brook trout habitat that will increase carrying capacity of adults, 3) reduce erosion, 4) assess effects of habitat enhancement on brook trout population, 5) improve angling opportunities.

Method applied to accomplish the project: Project planning, design work, and construction oversight will be conducted by the PFBC. Instream devices and course woody debris will be used to enhance habitat and reduce erosion. Brook trout populations and habitat will be evaluated pre and post treatment. Data collected in the treatment reaches will be compared to control reaches for analyses.

Additional information: The project is located within the larger Kettle Creek Valley, a highly popular area with anglers and outdoor recreationists. The upper Kettle Creek watershed has high recreational use potential and is a popular destination for wild trout anglers. In addition, the project is located in the heart of the Pennsylvania Wilds, a recent initiative by Pennsylvania's natural resource agencies to promote ecotourism, outdoor recreation, and conservation in northcentral Pennsylvania. The project is located entirely on state forest land, which is open to free, year-round public use. The watershed has excellent public access via state highways and forest roads that pass through the watershed. Degraded brook trout habitat will be rehabilitated throughout three stream sections totaling ~3.5-miles. Instream habitat improvement devices will be used to narrow the channel, and improve overhead cover and water depth, which will provide enhanced adult brook trout habitat and added protection of stream banks from further erosion. Course woody debris may also be added to improve overhead cover. The proposed project would be a significant long-term benefit to the watershed through enhancement of the brook trout populations and their habitats.

Fish passage barriers to be removed by this project: None – no fish passage barriers are present

Funding Information:

Estimate FWS funding for up to five years (in 2007 dollars):

Fund	Year					Total
	1	2	3	4	5	
NFHAP	\$45,000	0	0	0	0	\$45,000

What is the estimated duration of the project? 5 Years**Record anticipated first year partner contributions:**

Partner	Cash Matching	In Kind
PA Fish and Boat Commission	\$2,000	\$26,000
PA Dept. of Conservation and Natural Resources	\$30,000	\$15,000
PA Dept. of Environmental Protection		\$1,000
Tioga County Conservation District		\$1,000
Potter County Conservation District		\$1,000
Clinton County Conservation District		\$1,000
Trout Unlimited		\$1,000
Kettle Creek Watershed Association		\$1,000
U.S. Fish and Wildlife Service – Ecological Services, PA Field Office		\$5,000
Total:	\$32,000	\$52,000

Record anticipated new FTEs (information provided by Fish and Wildlife Service sponsoring office): None

N/A	Manager	N/A	Administrative Office / Assistant
N/A	Biologist	N/A	Outreach Specialist
N/A	Other Specialist / Scientist	N/A	Maintenance Worker
N/A	Technician / Fish Culturist		

Record Congressional District(s): Pennsylvania - Congressional District 5

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

A. Project Description and Scope of Work

The project is needed to restore and enhance degraded brook trout habitat within three streams in the upper Kettle Creek watershed, specifically Kettle Creek (main stem), Indian Run, and Trout Run. Habitat degradation likely stems from severe, clear cut logging and splash-damming in the late 1800's and early 1900's that severely altered the morphology of these streams. Remains of the log slides can still be seen in some the streams in the form of decaying logs placed parallel to the stream banks to encourage passing of logs downstream. Dirt and gravel forest road parallel portions of upper Kettle Creek and Trout Run and also have led to instability of stream banks, erosion, and a reduction in the quality of the instream physical habitat. The entire upper Kettle Creek watershed and tributaries (including all streams within the project area) are designated as an Exceptional Value system, the highest level of protection that can be assigned by the PA DEP. Today, brook trout populations in only 10% of Pennsylvania's historical subwatersheds remain >50% occupied (Hudy et al. 2006). The upper Kettle Creek watershed (including Kettle Creek and Indian Run) is one of the few subwatersheds within Pennsylvania that falls into this category, which further indicates the high priority of conserving and enhancing brook trout in this watershed. The adjacent subwatershed that includes Trout Run is listed as greatly reduced (<50% occupied).

The purpose of the project is to improve and increase brook trout habitat, specifically habitat that is conducive to supporting adult brook trout and to reduce bank erosion that continues to degrade habitat. The upper Kettle Creek watershed contains very good water quality. When water quality is good, the common limiting factor that restricts brook trout populations in northcentral Pennsylvania is the lack of adult habitat, specifically the lack of overhead cover and pools that are deep enough to provide adequate year-round protection. The project will aim to improve adult brook trout habitat and populations in degraded areas.

Goals of the project include improving the size structure of the brook trout population by increasing the carrying capacity of the enhanced stream section for adult wild brook trout, which will improve angling opportunities. Additionally, decreasing erosion and sedimentation will help to maintain the Exceptional Value status of the watershed and will benefit all aquatic species in the system.

EBTJV goals will be achieved through conserving and enhancing the wild brook trout populations in the upper Kettle Creek watershed and tributaries. The project will improve and increase the amount of adult brook trout habitat, improve angling opportunities for wild brook trout, and reduce erosion and sedimentation. The project will focus on improving the two major sources of physical habitat degradation in the watershed – historic damage to morphology of the streams due to severe logging practices (artificially wide and shallow) and more currently, erosion and sedimentation from dirt and gravel forest roads.

There are 5 objectives to this project: (1) form long-term partnerships that will play a vital role in conserving and enhancing brook trout in PA, (2) enhance adult brook trout habitat that will increase carrying capacity of these larger individuals, (3) stabilize banks and reduce erosion, (4) assess the effects of habitat enhancement on the brook trout population, and (5) improve angling opportunities

Project planning and design work will be conducted by the PFBC and USFWS. A certified contractor will conduct installation of instream devices (e.g., deflectors, cross vanes, bank cribbing, riparian plantings, etc.) and course woody debris to improve habitat and reduce erosion. Construction oversight and project management will be conducted by the PFBC. The PFBC has been designing and installing habitat enhancement structures under the Adopt-A-Stream program for nearly two decades and have successfully completed hundreds of projects throughout the Commonwealth. The PFBC will evaluate brook trout populations and habitat pre and post treatment and population dynamics data collected in the treatment reach will be compared to the control reach to determine if the habitat enhancement structures have improved the population. The PA DCNR will provide assistance with obtaining materials for project and transporting them to the site. The PA DEP and Tioga, Potter, and Clinton County Conservation Districts will provide assistance with obtaining encroachment permits necessary to work in the streams. The Trout Unlimited chapters and Kettle Creek Watershed Association will provide assistance with various hands-on tasks to aid in the completion of the project.

All lands within the project area are owned by the state of Pennsylvania and are part of Tioga and Susquehannock State Forests and managed by the PA DCNR. State forest lands are open to free, year-round public access in perpetuity. Duration of benefits is expected to be perpetual.

Expected results are improved adult brook trout habitat, increased abundance of adult brook trout within project area, and reduced bank erosion and associated sedimentation. Brook trout populations will be monitored via three-pass electrofishing and habitat will be assessed using the U.S. EPA's Rapid Bioassessment Protocols visual-based habitat assessment. Streams will be monitored for at least 1 year pre and 4 years post treatment. A final report for the project will be completed by the PFBC.

The following activities will occur during the first year of the project:

1. Project partners will meet and discuss project plans
2. Site/habitat assessment, planning, and design work will be conducted, and all necessary county, state, and federal permits obtained
3. Brook trout populations will be sampled and habitat parameters assessed to obtain pre treatment data in treatment and control reaches
4. Materials for project will be obtained and delivered to site
5. Instream habitat enhancement structures will be constructed
6. Project management and construction oversight will be conducted by PFBC

B. Partner Information

1. Pennsylvania Fish and Boat Commission

- In-kind assistance with site assessment, instream habitat improvement device design work, and acquisition of all necessary permits
- In-kind assistance with construction oversight, grant administration, and purchasing of materials for project
- In-kind assistance with coordination of partners and project management
- In-kind assistance with brook trout population and habitat monitoring and assessment (pre and post treatment and in control reaches)
- In-kind assistance with analysis of data and completion of final report
- Will provide \$2,000 worth of materials for instream structures through the PFBC's Adopt-A-Stream program

2. Pennsylvania Department of Environmental Protection

- In-kind assistance with obtaining encroachment permits required to work within PA streams

3. Pennsylvania Department of Conservation and Natural Resources

- In-kind assistance of services related to construction of devices and bank stabilization
- Cash and in-kind assistance in obtaining materials for project

4. U.S. Fish and Wildlife Service – Ecological Services, Pennsylvania Field Office

- In-kind assistance with site assessment and instream habitat device design work

5. Tioga, Potter, and Clinton County Conservation Districts

- In-kind assistance with obtaining encroachment permits required to work within PA streams

6. Kettle Creek Chapter and Gods Country Chapter of Trout Unlimited

- In-kind assistance with instream habitat work and other tasks as needed

7. Kettle Creek Watershed Association

- In-kind assistance with instream habitat work and other tasks as needed

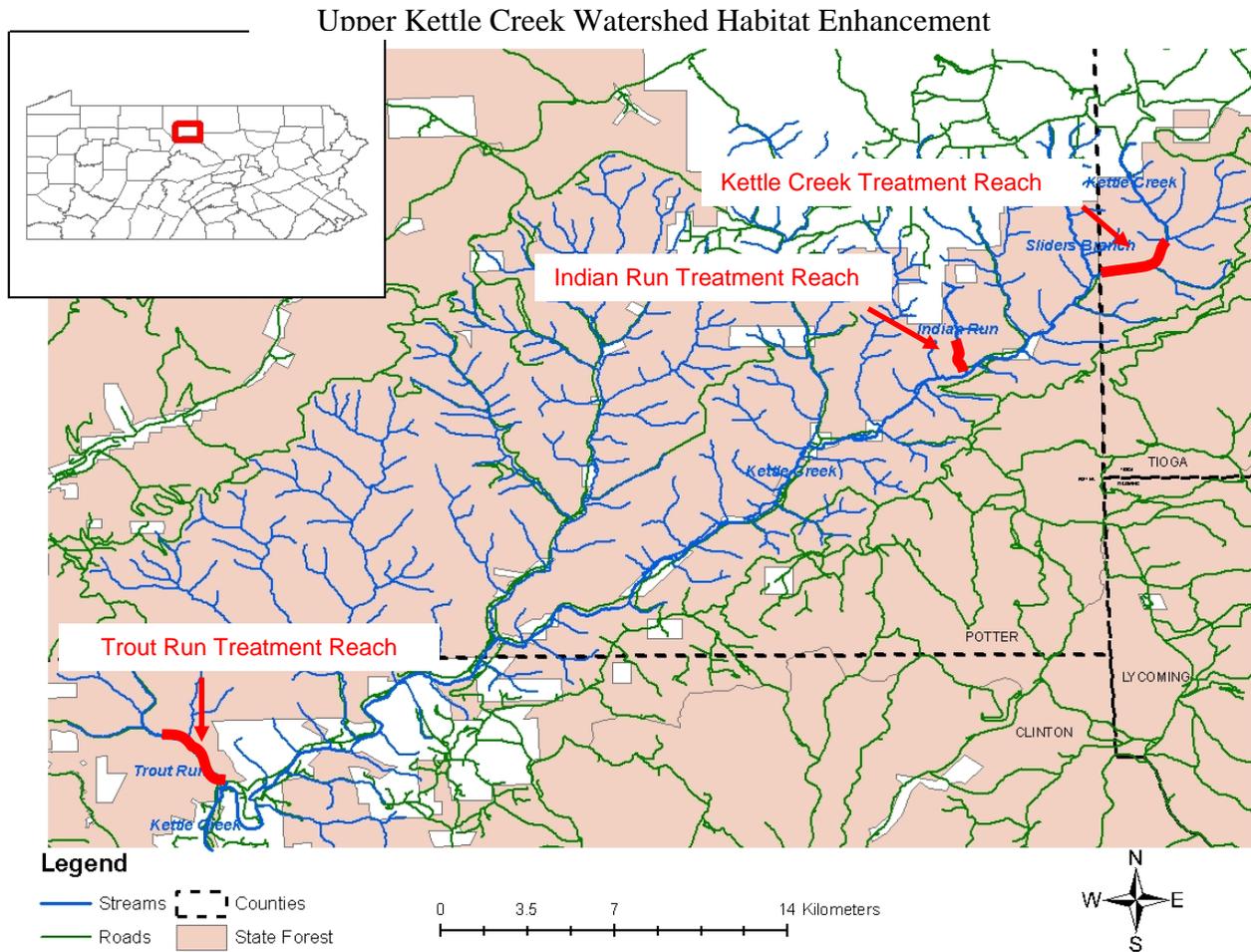
- PA DCNR is an equal amount to the grant request.

-Ratio of partner contribution to grant request is **2.2:1**

-Benefit of project is instream habitat rehabilitation and enhancement throughout **~3.5-miles** of stream

-Five (5) partner categories are identified in the partnership – state agencies (3), federal agency (1), local government (3), and local conservation groups (2), local watershed group (1)

V. MAP OF PROJECT AREA



Coordinates for center point of project areas (NAD 83): Trout Run: 41.441171 / 77.927339
Kettle Creek: 41.619909 / 77.584099
Indian Run: 41.589089 / 77.651497

HUC6 level watershed code: 020502

V. PHOTOGRAPHS OF PROJECT AREA



Photograph of Indian Run showing the riffle/run dominant habitat and lack of adult brook trout habitat. Photo by: PA Fish and Boat Commission



Additional photographs of the project area were not available. However, the above photographs taken in an adjacent drainage show habitat that is very similar to that in the project area and is characteristic of many small brook trout streams in northcentral Pennsylvania that were impacted by severe logging and splash damming in the late 1800's and early 1900's. Photos by: PA Fish and Boat Commission.

VI. PROJECT BUDGET

PFBC = Pennsylvania Fish and Boat Commission

PADEP = Pennsylvania Department of Environmental Protection

PADCNR = Pennsylvania Department of Conservation and Natural Resources

USFWS = U.S. Fish and Wildlife Service – Ecological Services, PA Field Office

TCCD = Tioga County Conservation District

PCCD = Potter County Conservation District

CCCD = Clinton County Conservation District

TU = Kettle Creek Chapter and Gods Country Chapter Trout Unlimited

KCWA = Kettle Creek Watershed Association

Activity	Partner	NFHAP Request	Non-Fed. Contribution	Federal Contribution	Total
Site Assessment and Design Work					
I. Salaries	PFBC USFWS		\$15,000 (in-kind)	\$5,000 (in-kind)	\$15,000 \$5,000
Instream Habitat Enhancement Work					
I. Salaries	PFBC		\$8,000 (in-kind)		\$8,000
II. Contractor Services	Contractor TU KCWA	\$45,000	\$1,000 (in-kind) \$1,000 (in-kind)		\$45,000 \$1,000 \$1,000
III. Supplies/Materials	PADCNR PFBC		\$15,000 (in-kind) \$30,000 (cash) \$2,000 (cash)		\$45,000 \$2,000
Environmental Permitting					
I. Salaries	PADEP TCCD PCCD CCCD		\$1,000 (in-kind) \$1,000 (in-kind) \$1,000 (in-kind) \$1,000 (in-kind)		\$1,000 \$1,000 \$1,000 \$1,000
Brook trout Population Monitoring and Habitat Assessments					
I. Salaries	PFBC		\$15,000 (in-kind)		\$15,000
Monitoring Data Analysis and Final Report of Project					
I. Salaries	PFBC		\$4,000 (in-kind)		\$4,000
	Totals:	\$45,000	\$95,000	\$5,000	\$145,000

-If project is funded, NFHAP grant will be managed and administered by the PFBC.

VII. EVALUATION QUESTIONS

A. Conservation of Sustainable Brook Trout Populations:

The entire upper Kettle Creek watershed and tributaries are designated as an Exceptional Value system, the highest level of protection that can be assigned by the PA Department of Environmental Protection. The project area and watershed is located on state forest land that provides protection from development in perpetuity. Many of PA's highest quality wild brook trout streams are located on state forest lands. Upper Kettle Creek, Indian Run, and Trout Run harbor good, sustainable populations of wild brook trout and the streams are popular destinations for wild trout anglers. Recreational quality of the fisheries is high. The project meets components of all five objectives outlined in Pennsylvania's Brook Trout Conservation Strategies state plan. The project will aim to improve habitat and enhance the existing brook trout population.

B. Endangered Species:

There will be no known benefits to any federally or state listed threatened or endangered species related to the completed project. There will be no known benefits to any state listed species of concern.

C. There is no "C" in the project proposal application.

D. Economically important species not also listed as threatened and endangered species:

Wild brook trout are an economically important species in Pennsylvania. The Slate Run watershed is a popular destination for wild trout anglers and angling opportunities would be enhanced through this project. Recreational quality of the fishery is high. A 2004 statewide angler use, harvest, and economic survey conducted by the PFBC indicated that wild trout angling has an economic benefit of about \$2 million annually to the local and state economy.

E. Special Considerations:

The entire upper Kettle Creek watershed and tributaries are designated as an Exceptional Value system, the highest level of protection that can be assigned by the PA Department of Environmental Protection. Severe clear cut logging and splash damming practices severely altered the morphology of these streams from which they have never been able to recover. The shear energy involved in splash damming is many times greater than even extreme flood events in these small systems. Thus, the streams are artificially wide and shallow in areas and are dominated by long reaches of shallow riffle/run habitat. In addition, dirt and gravel forest roads are present within the watershed and parallel portions of Trout Run and Kettle Creek and have resulted in erosion and habitat degradation in a number of areas throughout the proposed project area. Much interest is present within the PFBC, DCNR, Trout Unlimited, Kettle Creek Watershed Association and local sportsman groups to maintain, protect, and enhance the upper Kettle Creek watershed and the wild trout populations it supports.

F. EBTJV Habitat Restoration Priority:

The restoration priority of the subject watershed was not available on the EBTJV website at the time proposals were due.

G. Habitat Connectivity and Enhancing Population Mobility

The project is located in the upper Kettle Creek watershed, which is listed as reduced (50-90% of habitat occupied). The project occurs within the main stem of Kettle Creek and its tributaries (Indian Run and Trout

Run), which support good wild brook trout populations as well. Habitat connectivity between tributaries and main stem is good. Most (>80%) of the upper Kettle Creek watershed is located on Susquehannock, and Tioga State Forest Lands, which provide for free year-round public access and protection for the watershed in perpetuity. The Trout Run watershed is basically entirely on state forest land except for one small inholding at the mouth that accounts for < 1% of the watershed area. The entire Indian Run watershed is located on state forest land and the upper Kettle Creek watershed through the project area to the headwaters and downstream for several miles is entirely on state forest land as well. Additionally, the Exceptional Value designation by the PA Department of Environmental Protection provides additional protection for the watershed and is the highest level of protection that can be assigned.

The project area and tributaries already contain good, fishable populations of brook trout and the watershed is a popular destination with wild trout anglers. However, we feel that the populations could be considerably improved by increasing the amount of adult brook trout habitat, as this appears to be the main limiting factor for these streams. The probability of success for the project is high and will enhance the current brook trout population and angling opportunities. The habitat enhancement devices utilized by the PFBC generally have life expectancies of at least 15-20 years, with some continuing to function for very long periods after installation. The main cause of habitat degradation in the project reach likely stems from severe clear cut logging and splash damming practices that severely altered the morphology of these streams and to a lesser degree, adjacent dirt and gravel forest roads. Both factors have resulted in a reduction of adult brook trout habitat and bank erosion, which will be addressed through the project to the fullest extent possible.

H. MANAGEMENT ASSETS:

Monitoring of the brook trout population pre and post treatment will be conducted throughout the duration of the project by the PFBC using standard agency protocols for monitoring and evaluating trout populations in wadeable streams. Brook Trout Enhancement special angling regulations are currently being evaluated on upper Kettle Creek and its tributaries. The regulations allow for year-round angling with no harvest of brook trout. As part of the evaluation, a number of long-term sample sites have been established and have been surveyed multiple times since the regulations were implemented in 2002. Thus, these sites will provide excellent pre treatment data for the project and those sites located outside the treatment reach and in other tributaries within the drainage will serve as excellent controls. It is not common that we have the excellent opportunity to have such intensive pre treatment brook trout population dynamics and habitat data available to aid in analyses.

Monitoring of the physical habitat will be conducted pre and post treatment by the PFBC using the U.S. EPA's Rapid Bioassessment Protocols visual-based habitat assessment.

The project area is located entirely on state forest land that is accessible year-round to free public fishing. Angling in the Kettle Creek and Indian Run project areas will follow the catch and release regulations already established by the PFBC for the streams. Both streams are open for year-round angling under the regulations. Angling in the Trout Run project area will follow the general statewide regulations established by the PFBC for this stream.

The project is being developed as a high-profile demonstration project to promote the EBTJV and the positive outcomes that can be gained through partnerships. We feel confident that the project will increase public awareness of the EBTJV and its goals and objectives and will hopefully provide an avenue to garner new partnerships and added resources to conduct additional habitat enhancement and restoration projects in northcentral Pennsylvania. The project area will be signed and will be available for public education of stream habitat enhancement work and its benefits to the watershed and the wild brook trout population.

Literature Cited

Hudy, M., T. M. Thieling, N. Gillespie, and E. P. Smith. 2006. Distribution, status, and perturbations to brook trout within the eastern United States. Technical report available at www.brookie.org.