EBTJV And NFHAP's:
Thorn Creek, WV:
Watershed Aquatic Passage Program

Project Location: Pendleton County, Near Moyer WV

Congressional District: WV-02

EBTJV / NFHAP Funding Requested: $45,000

Total Project Cost: $228,500

Total Federal Matching: $75,000

Total Non-Federal Matching: $108,500

Sponsoring Office: WV Field Office, Elkins, WV

Type of Project: Instream Habitat Protection and Restoration

APPLICANT

Organization: Trout Unlimited

Project Officer: Gary Berti. Project Manager, Potomac Headwaters Home River Initiative

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Sponsoring Fish and Wildlife Service Fisheries Office

Fish and Wildlife Service Office: WV Field Office

Project Officer: John Schmidt

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Date Submitted: 10/2/09

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

A. Project Description and Scope of Work (not to exceed 500 words)

The objective of this program is to remove the 9 identified fish passage blockages within a 50 square mile wild brook trout watershed in Thorn Creek of the South Branch of the Potomac. These impediments block passage in one or both directions, and serve to sustain an outward migration of brook trout into waters which, currently, are lethally warm for brook trout in typical summer conditions. Removal of these blockages will open over 25 miles of perennial stream to brook trout – improving the long term security of the population. Thorn Creek serves as a brook trout nursery for the upper South Branch of the Potomac.

Thorn Creek was listed as *severely impaired* in the EBTJV's 2005 landmark assessment of the eastern brook trout watersheds. Because of the quality and quantity of the water sources - 16 spring heads of 100 gpm or more, pH 7 or greater, 54 degree F or less[1] - brook trout persist in the Thorn Creek drainage despite stream and riparian habitat losses due to heavy agricultural use and historic post flood dredging. Habitat fragmentation from poorly designed road crossings increases the population's risk and reduces access to upstream spawning and rearing habitats. Moving the status of Thorn Creek to I*mpaired*, H*ealthy* or possibly *Intact* will require addressing the habitat limitationss while addressing the habitat fragmentation across the entire watershed. This program will address the fragmentation issue throughout the watershed.

In summer 2009, TU and the NRCS entered into a three year project to implement brook trout restoration in the upper South Branch of the Potomac with special emphasis on Thorn Creek and its tributaries. Working with landowners, TU provides outreach, fundraising, conceptual designs and contract services for instream and near-stream work. Typical work under this agreement includes riparian buffer/forest restoration, stock exclusion and alternative watering supply, fish friendly agricultural in-stream crossings, stream bank stabilization and instream habitat improvement. This program addresses agricultural and in-stream brook trout limitations for most of the landowners along the stream.

In September of 2009, in response to the habitat fragmentation issue, TU requested support from the Chesapeake Bay program to eliminate all 9 identified stream blockages throughout the watershed and replace with spans or open bottom culverts. That funding request was partially funded. TU is requesting support from the EBTJV for completion of this work.

[1] USGS Springs of West Virginia: 50th Anniversary edition, 1986

B. Partner Information (not to exceed 100 words)

A diverse array of partners sees the benefit of expanding and enhancing this watershed's native trout habitat. Two federal agencies, two state agencies, two national conservation organizations, landowners, corporate interest, private volunteers, local conservation organizations and school children all have a role in the project.

Fish passage enhancement is a critical component in the broader effort to increase populations and habitat range in Thorn Creek. The project mitigates limiting factors including riparian restoration, nutrient reduction, sediment source elimination, instream habitat restoration, as well as fish passage obstructions. This list includes only the aquatic passage partnership.

Partner Name	Contribution In-Kind	Contribution Cash	Federal or Non-Federal	Partner Category	Role of Partner
NRCS	5000		Fed	Federal Agency	Technical/engineering Assistance
ChesBay Program - NFWF		75,000	Fed	National Conservation Agency (with EPA)	Funding source
Landowner		84,000	Non fed	Landowner	Funding source/in kind contributions
WV DNR			Non fed	State Agency	EBTJV survey work
WV Dept. Of Highways	2500		Non Fed	State Agency	Provide plant materials/design support
School Programs	3,600		Non fed	Local Governement	Planting and monitoring
TU PHHRI	5000		Non fed	Local Conservation Organization	Program/Project management
TU volunteers	5,000		Non fed	Local Volunteers	Planting/survey assistance
Dominion		10,000	Non Fed	corporation	Funding
EBTJV/NFHAP		45,000	Fed		Funder

C. Project Timeline:

Property/Description/Timeframe

a. Harman – perched culvert / remove and replace with span: Fall/Winter 2009

b. Jamison - low water bridge remove and replace with span: Summer 2010

c. Puffenberger – low water bridge will require downstream grade control to create pool, plus additional habitat work to access pool. Summer 2010

d. Mortensen, nee Woods – eroded span, replace and re-connect flood plain. Fall 2010

e. Sponaugle – perched culvert will be mitigated by raising pool elevation to outlet and installing a series of pool/drop structures to stream elevation. Winter 2010

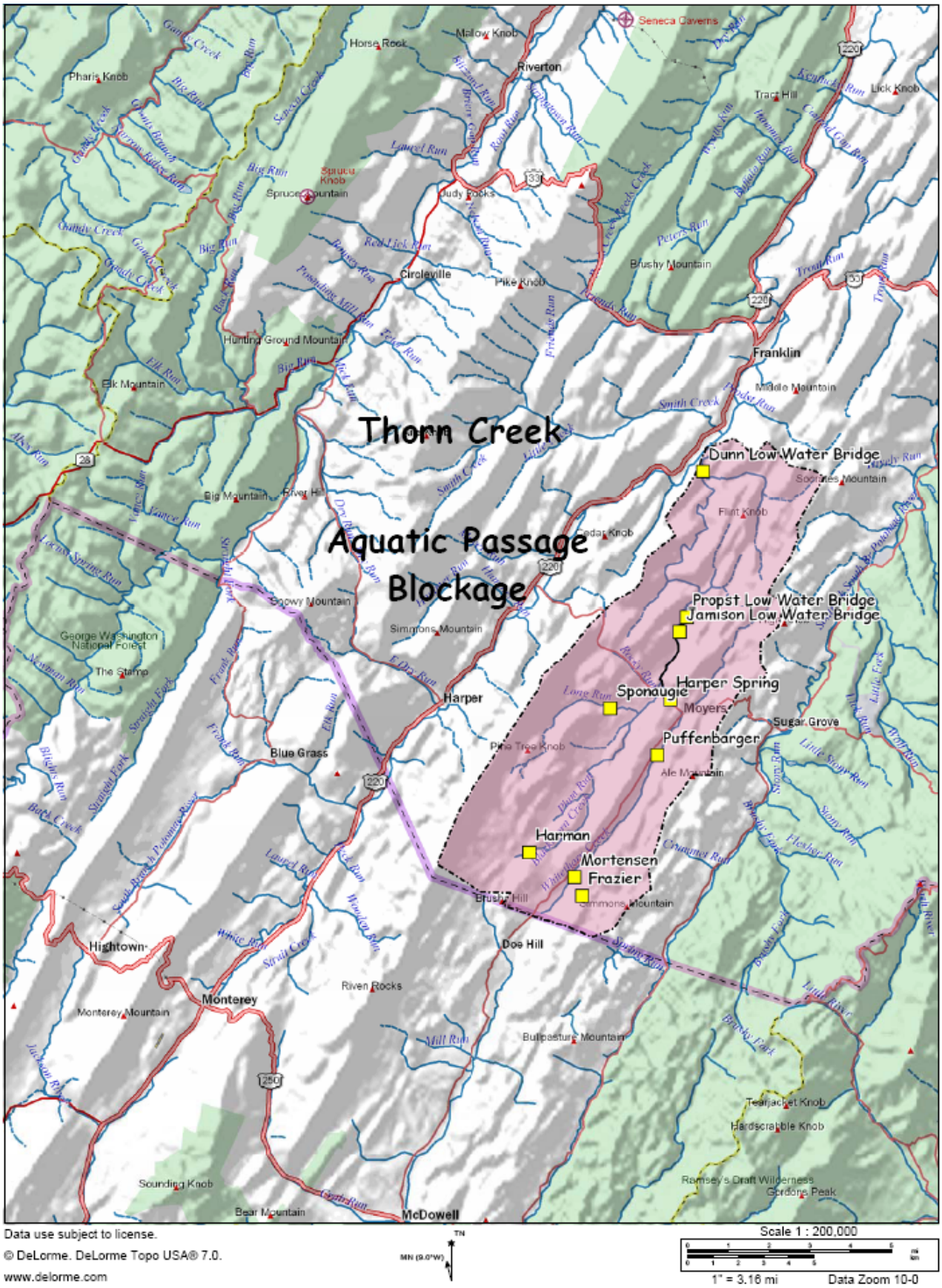
f. Frazier – improper culvert installation / replace with span at proper elevation. Spring 2011

g. Probst - low water bridge remove and replace with span. Summer 2011

h. Harper – perched culvert access to spring habitat will require grading of access road – Summer 2011

i. Dunns – low water bridge remove and replace with span: Summer 2012

II. MAP OF PROJECT AREA (one only)


Thorn Creek
Aquatic Passage
Blockage
Dunn Low Water Bridge
Propst Low Water Bridge
Jamison Low Water Bridge
Harper Spring
Sponaugle
Puffenbarger
Harman
Mortensen
Frazier
Seneca Caverns
Riverton
Circleville
Franklin
Harper
Blue Grass
Hightown
Monterey
McDowell
Doe Hill
Sugar Grove
Moyers
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Scale 1 : 200,000
1" = 3.16 mi
Data Zoom 10-0

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

Figure 1: Propst 's low water bridge, typical of three fish passage obstructions in the watershed.

IV. PROJECT BUDGET

A. General Requirements:

This program will remove and replace 9 aquatic organism passage obstructions in the Thorn Creek watershed.

- Three projects (Dunn, Propst, and Jamison) program will remove typical low water bridges, as seen in figure 1, with spans designed to convey the historical range of stream flows for the location within the watershed. Low flow channels will be incumbent to facilitate summer, low flow continuity. Flood and high water flows will be considered in the design specifications to avoid probability of debris plugs, with flood plain drainage incorporated into ramps and approach structures as required. Replacement structures will be steel and or concrete covered with wooden decking. Site conditions will determine final design criteria.

- Three projects (Harman, Frazier, and Harper) require the removal and replacement of culverts on small farm roads. Harper's and Harman's projects are perched culverts preventing brook trout access to spring resources which would otherwise provide spawning and rearing habitat. One of these, Harman, is located on a non-listed reproducing trout stream, possibly creating conditions for additional stream miles to be

listed and used for reproduction, thereby adding to the case for EBTJV subwatershed upgrade to higher status. Frazier's crossing is an improperly sized and set culvert causing not only fish passage issues, but severe head cutting of upstream channel and creating an immense sediment source. Stabilization of headcut is addressed using other program funding.

- Two projects require downstream grade control to increase the pool elevation to allow for fish and aquatic organism passage. These projects are located on the Sponaugle and the Puffenberger properties.

- Lastly, one culvert is encased in concrete, crushed and requires replacement with a small laminated bridge of about 16 feet. This crossing will be a steel reinforced single span with concrete footers. A headwall will be built from native stone. The decking laminated pressure treated lumber.

Expenses associated with the program include the following:

Project management and coordination		19800
Preliminary survey and conceptual design		6200
Contract services:		
Steel: 27 spans at $3500	94,500	
Equipment rental (+	32,000	
Bridge Decking 1440@$15	31,100	
Preformed Arch Bridge (3)	19,000	
Concrete	7,200	
Hand labor	5,700	
Other materials	5,000	
Seed, mulch, plant matl	5,000	
Debris disposal	3,000	202,500

Total costs associated with this project: $228,500

B. Budget Table

Partner	Activity	Total costs	NFHAP Request	Non-Fed. Contribution	Federal Contribution	Acres/ miles Affected
Trout Unlimited	Project coordination. Management and contracting	19800	4500	10000 Dominion 5300 landowners		25 miles
TU and	Site survey and data	6200		2600		25 miles

contractor	collection preliminary designs			Landowner 3600 schools		
contractors	Contract Services Concrete Steel spans Decking Equipment rental Preformed arches Other materials Labor Seed Mulch Plants Demo,disposal	 7200 94500 31100 32000 19000 5000 5700 5000 3000	40500	72500 Landowners 2500 plant materials WVDOH 5000 plant labor – TU Vols	75,000 Chesa peake Bay $5000 NRCS staff time.	25 miles
Totals		**228500**	**$45,000**	**101,500**	**80,000**	**25 miles**

V. EVALUATION QUESTIONS (4 pages maximum)

A. Conservation of Sustainable Brook Trout Populations:

The landowners along Thorn Creek take a fierce pride in the brook trout that inhabit these waters. They are active participants in the protection and restoration of brook trout. Projects worked under this program will require 10 -15 year agreements to maintain and monitor the works installed. Passage projects will provide perpetual benefits for the brook trout populations.

This project will contribute to range-wide and regional EBTJV goals by providing the instream and riparian habitat improvements demanded by the historic mis-management of agricultural lands, ill advised flood response, and well intentioned, but misguided, transportation access efforts. The intent of these improvements is to improve the watershed's accessible habitat to greater than 50% of the available watershed to meet the standard set for *Healthy* brook trout watersheds. The rangewide goal of creating additional *Intact* watersheds could be met if the passage blockages are removed and the headwaters of non-reproducing tributaries are opened to passage by brook trout.

Thorn Creek is specified in the West Virginia Brook Trout Strategy as a targeted watershed for restoration. Brook Trout is listed as a species of concern in the WV Wildlife Action Plan.

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

The Virginia big eared bat, a state and federally listed endangered species, has several hibernacula's within the project area. Restoration of riparian areas improves forage opportunities for the species.
Brook trout are species of conservation concern.

Removing livestock from the stream benefits cattle - a species of economic importance.

C. Project Benefits:

The Thorn Creek sub-watershed is listed by the 2005 EBTJV Status and Threats report as *severely impaired*. The watershed received a .3 priority ranking. The project is listed as a 'reduced' watershed in the priority ranking scheme listed on the EBTJV website. This project will enhance habitat and remove fragmentation with the intent to raise the status to Healthy.

Funding of this project will contribute to the removal of three problematic low water bridges (see map, Dunn, Propst and Jamison - low water bridges) of which two are located within a quarter mile of each other. The brook trout can pass through the structures in downstream only direction at these obstructions. Removing these structures and replacing with open bottomed spans will allow fish to achieve the spring habitat and historical spawning and rearing zones of the watershed, thereby allowing the migratory fish a chance to contribute to the gene pool in the upper half of Thorn Creek and its primary tributaries of Whitethorn, Blackthorn and Stauffle Run.

In addition to the low water bridges, the removal of other 6 obstructions will provide unimpeded access to 25 miles of stream.

Successful implementation of the Thorn Creek program, which fish passage restoration is a primary component, will provide a stable brook trout source to Thorn Creek and its tributaries, and will provide a steady source of brook trout for the South Branch of the Potomac. This program, in its entirety, will

- Address limitations caused by lack of riparian forest;
- Remove cattle from the stream;
- Enhance instream habitat through strategic use of woody materials, pool creation and reintroduction of structure and cover;
- Providing strategic shading to the stream using native tree and shrub species;
- Provide free fish passage throughout the watershed by systematically removing structures that prevent access to otherwise prime habitat.

The probability of the success of the project is increased because the people who live along the stream are fierce brook trout advocates and because the work is done on willing landowners property. The work being accomplished is sustainable, developing land management changes and providing the resources to sustain the changes over the long term. Each aspect of this project is developed to address changes in the long term, for the benefit of the landowner, the stream and water quality and with the brook trout as the primary motivation. The locals have developed a pseudo-neighborhood watch for brook trout poachers, problems and issues.

Agency support is strong for this work with additional assurances that ill-advised or damaging activities are addressed properly at the permit phase, as well as the implementation phase.

D. Endurance of Benefits

Because the works proposed are all on private lands, only a handful of land is placed in perpetual easements. Projects implemented on private lands, in most cases, include 15 year agreements. Some are 10 year agreements. Working with our partner, the Potomac Conservancy, we hope to migrate these agreements into perpetual conservation easements using state and federal tax advantages as an additional motivational factor. Our ranking criteria for project work (under our agreement with NRCS) considers the time frame under agreement as one source of additional points and provides the landowner with the concept of perpetual easement as a management option. TU and its partners strive to incorporate perpetual easements into the discussion with landowners, but at this time only a very small percentage of the land is in perpetual protection.

The root cause of this watershed's degradation is historical streamside land use driven by misguided and under-funded agricultural interests. The practice of allowing unfettered access by cattle into the stream, destroys riparian areas to gain an additional 50 feet of poor pasture land, contributes to unnatural temperature loadings, and creates sediment and erosion processes initiated by hoof shear has done a number on this stream. Our NRCS partnership helps to address these issues by allowing for the fence installation, riparian restoraiton, alternative water supplies, and instream restoration on the agricultural lands adjacent to the stream.

The removal of instream habitat by mechanical means, usually after large storm events, usually with bulldozers using side cast methods, has been addressed in state guidelines and through educational programs. NRCS funds are being used in the watershed to address the loss of cover, pool and diversity habitat issues. Methods to address this issue include narrowing over-widened stream channels, removal of artificial berms along stream banks, initiation of woody materials into the stream, and installation of vanes and structures which provide self-maintaining pool, forage and cover habitat.

Many fish passage blockages are the result of on-farm crossings which are designed for traffic, rather than the fish. Small farm crossings can be addressed by property owners using NRCS programs, provided the landowner is a producer of farm products. This leaves out the second homeowner, non-farming resident, and the larger crossings whose financial resources exceed the program benefit. These projects will be served by our limited partnership with the Chesapeake Bay program (which funded $75,000 of a $190,000 request for fish passage remediation) and by this request for funding through the EBTJV.

The watershed's prolific water resources provide a measure of resiliency which allows for the persistence of brook trout within the watershed. Mitigation of the limiting factors will allow the populations and range to grow and flourish within the watershed.

Currently, no threat exists within the watershed from non-native stockings of competitive species. At one time fisheries managers attempted to stock rainbow trout in the

watershed, but the local outcry was strong, swift and effective. No further stocking took place. No plan to stock this stream exists.

Stocking does take place in the South Branch below mouth of Thorn Creek at Franklin, and above at the village of Cave. Virginia stocks its portion of the South Branch in Bluegrass Valley. Natural and man-made barriers at the mouth of Thorn Creek allow fish to travel out of the watershed while limiting the ability of stocked trout to access the stream from the South Branch.

E. Management Assets:

Trout Unlimited is present in the watershed with members who live there and with project management that works in the watershed. Currently, our efforts include the maintenance and monitoring of projects implemented since 2005. NRCS staff monitors projects which they have contributed program assets to ensure practices are working as designed. Biologists with USFWS and WVDNR have been on site and review the works installed and provide insight for future direction. The program partners will monitor, review and address potential fish blocking permit applications within the stream at a higher level than most stream permit reviews in the state. In addition, local school programs have, and will continue monitoring Thorn Creek using 'Stream Sampler' protocols developed in conjunction with The Mountain Institute. This program provides school children the opportunity for hands on stream science, a chance to connect with conservation and an opportunity to hear about brook trout while contributing to the science and collection of data used for decision processes.

Recreational fishing is supported by a public fishing area owned by WVDNR located about 4 miles from the mouth of Thorn Creek, and by permission only to fish on private lands. Most land is posted for fishing, but some residents are willing to provide access to those who practice catch and release angling. Permission is expected and required to alleviate poaching issues associated with many brook trout streams along roadways.

Outreach and education are critical components for programs involving large numbers of private landowners. TU provides one to one outreach for potential project partners, which usually involves strong educational components, as well. The aforementioned 'Stream Samplers' program involves approximately 75 middle school science students from the local school system. Agency outreach will be facilitated as NRCS has designated Thorn Creek as a demonstration project for the application of fluvial geomorphology in a trout restoration setting. Workshops to take district conservationists are planned with tours, demonstrations and description of the process and practice of creating habitat. Tours of the watershed are welcomed.

F. Other Special Considerations:

This request is specific to the removal of fish passage blockages within the watershed. It is a component of a larger effort to remove all the unnatural fish passage blockages

within the watershed. The fish passage mitigation projects play a critical role in the overall enhancement and restoraiton of the Thorn Creek brook trout habitat.

The proposal includes project specific components such as concrete, steel beams, construction equipment and also includes general equipment such as survey and software to facilitate the proper sizing, length and flow requirements of crossing structures through the entire range of expected flows – low water to flood stages. These assets will be both specific to this project, but also will be made available for other works in the watershed and in the Potomac Headwater program. While this program is building sustainable practices into the core of the community, it also is building the capacity to replicate this work throughout the Potomac Headwaters and beyond.

G. Supporting Documentation and Management Plans:

1. Springs of West Virginia: 50th Anniversary Revised Edition, WV Geological and Economic Survey, 1986
2. EBTJV website: EBT: Status And Threats 2006
3. EBTJV website: EBT: Roadmap to Restoration 2007
4. EBTJV website: Priority Watersheds 2008
5. EBTJV website: West Virginia Brook Trout Working Group, Conservation Strategy for Brook Trout 2007