

**Upper South Branch/Thorn Creek Brook Trout Patch Restoration and Monitoring, Cave,
WV**

Project Location (State, County, Town): West Virginia, Pendleton, Franklin

Congressional District of Project: 02

Congressional District of Applicant: 02

NFHP/EBTJV Funding Request: \$43,000.00

Total of Other Federal Funding Contributions: \$22,500.00

Total of Non-Federal Funding Contributions: \$204,750.00

Total Project Cost: 270, 250.00

Applicant:

Project Officer: Dustin Wichterman
Organization: Trout Unlimited
Street: 1777 North Kent Street
City, State, Zip: Arlington, VA 22209
Telephone Number: 304-614-5709
Fax Number: N/A
Email Address: dwichterman@tu.org

U.S. Fish and Wildlife Service Sponsoring Office:

Project Officer: Callie McMunigal
Fish and Wildlife Service Office: Appalachian Fish and Wildlife Conservation Office
Street: 400 East Main Street
City, State, Zip: White Sulphur Springs, WV
Telephone Number: 304-536-1361 ext 7342
Fax Number:
Email Address: callie_mcmunigal@fws.gov

USFWS FONS Database Project Number: 53374-2017-421

**Coordination Completed with Sponsoring U.S. Fish and Wildlife Service Office
(Check One):**

 X Yes
 No

 9/18/2017 **Date Coordination Began**

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

A. Project Goal:

This project will restore habitat to a degraded three mile section of Thorn Creek in support of strengthening the Thorn Creek Patch, and expanding that patch into the South Branch of the Potomac. In addition, it will include a strong monitoring component to document existing patch conditions in the Upper South Branch of the Potomac in West Virginia. Much work has occurred in the Thorn Creek watershed, to the benefit of 10 miles of its headwaters, but the most obvious remaining need is located in the West Virginia Division of Natural Resources Wildlife Management Area $\frac{3}{4}$ mile publicly available section (the only publicly available reach of Thorn Creek) and the two privately held properties immediately above and below the WVDNR's holdings. The project will restore instream and riparian habitat to provide pool and run habitat, stabilize banks, and install a robust native mixed hardwood and conifer forest. The overall objective is to 1) bolster the existing brook trout patch and 2) provide a ready source of sustainable heritage brook trout to the South Branch of the Potomac in Virginia and West Virginia 3) document the existing and expanding brook trout patch network in the upper South Branch.

B. Project Description:

This project will restore in-stream and riparian habitat on 3 miles of degraded habitat on both private lands (2.25 miles) and public lands (.75 mile) and monitor upper South Branch patches and unassessed streams to:

- 1) Provide an important link between main stem Thorn Creek and the upper South Branch of the Potomac Watershed;
- 2) Enhance brook trout angling opportunities and quality of fishing in one of WV DNR's Wildlife Management Areas;
- 3) Provide the source stock and migration routes to open additional occupied patch area in the Upper South Branch main-stem.
- 4) Document the actual existing brook trout patch network to inform future management and restoration decisions.

C. Project Methods/Design (Max Characters: 350):

TU will:

- utilize large wood structures to restore habitat structure
- install native hardwoods in strategic riparian areas using large (6' +) stock trees
- employ very high standards to protect the resource
- reconnect flood plains on private lands to reduce stream power and diffuse erosional forces
- employ electrofishing and radio telemetry

D. Project Timeline:

This project will be completed in its entirety by September, 30, 2019.

E. Describe the Problem and Specific Cause of the Problem (Max Characters: 350):

Thorn Creek has been degraded by timber harvest, flood recovery activities, agriculture and development. The result is an incised, over-widened, channelized, plain bed system open to solar gain with limited pool and run habitat.

F. Summarize the Project's Expected Outcomes (Max Characters: 350):

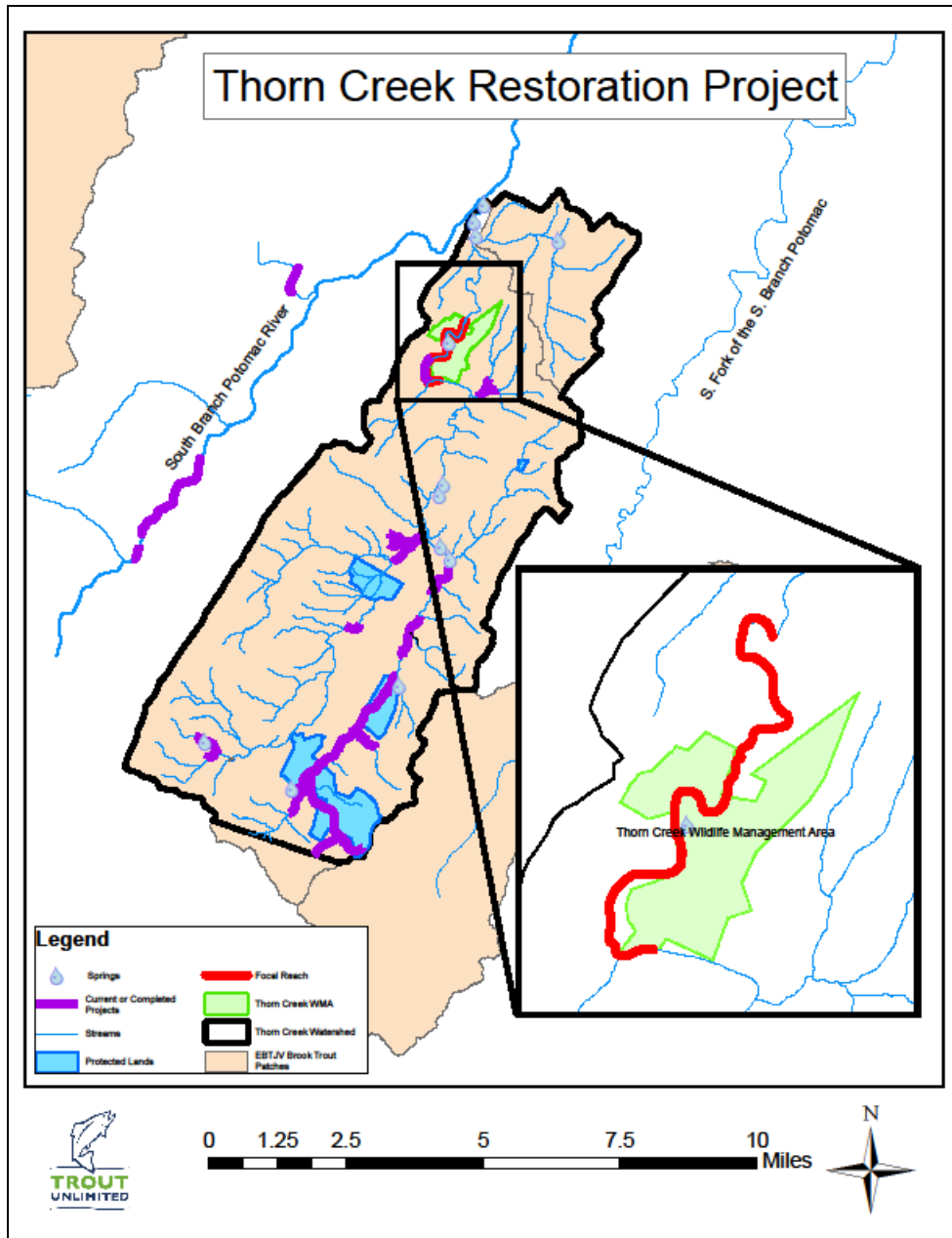
This project will:

- Restore 3 miles of degraded habitat in an exceptional water quality stream
- Advance angling opportunities and quality on WVDNR section of stream
- Provide source stock to the South Branch of the Potomac to add to the occupied patch inventory
- Produce bigger, more and healthier brook trout, and the monitoring to prove it.

G. Partner Information:

Partner Name	In-Kind Contribution	Cash Contribution	Federal or Non-Federal Contribution	Partner
				Category
Trout Unlimited	\$21,500.00	3,000.00	Non-Federal	Non-Profit
Trout Unlimited	\$12,000.00	500	Federal	Non-Profit
WVDNR	\$14,000.00	0	Non-Federal	State Agency
USFWS Partners Program	\$10,000.00	0	Federal	Federal Agency
Private Landowners	\$125,000.00	\$31,250.00	Non-Federal	Private Landowners

II. PROVIDE A MAP OF THE PROJECT AREA



III. PROVIDE PHOTOGRAPH(S) OF THE PROJECT AREA

Uploaded via the website.

IV. PROJECT BUDGET (see next page for an example of the Project Budget Table)

Partner Name	Partner Category *	Activity of Partner **	Budget Category***	EBTJV	Non-Federal Contribution		Federal Contribution		Total Contribution	Acres/Miles Affected
				NFHAP Request	In-Kind	Cash	In-Kind	Cash		
Trout Unlimited	Conservation Group (National)	Technical Services	Survey, Design and permitting for private and public properties: NFHAP dollars to be used on DNR site.	10,000.00	10,000.00	0	10,000.00	0	30,000.00	10 acres, 3 miles
		Restoration Tech Services and Implementation	Travel for survey, assessment, implementation	2,100.00	0	500.00	0	500	3,100.00	10 acres, 3 miles
		Restoration	Construction Labor and oversight	7,500.00	0	2,000.00	2000	0	11,500.00	10 acres, 3 miles
		Restoration	Equipment-Hydraulic Excavator, pumps, flow diversion materials, spill kits, etc	10,000.00	1,500.00	0	0	0	11,500.00	10 acres, 3 miles
		Restoration	Materials-Large Stock trees and protection, rock	5,000.00	0	0	0	0	5,000.00	10 acres, 3 miles
		Monitoring	Equipment	0	1000	500	0	0	1500	10 streams
		Monitoring	Labor	6,400.00	8000	0	0	0	14,400.00	10 streams
		Outreach	Education	2,000.00	1000	0	0	0	3,000.00	10 streams
West Virginia Division of Natural Resources	State Agency	Monitoring	Labor	0	\$2,000.00	0	0	0	2,000.00	
		Restoration	Materials	0	\$12,000.00	0	0	0	12,000.00	0.5 acres, 0.75 miles
Private Landowners	Private Landowners	Restoration	Equipment and Labor	0	0	\$125,000.00	0	0	125,000.00	9.5 acres, 2.25 miles
		Restoration	Materials-Rock, Logs, tree Protection	0	\$31,250.00	0	0	0	31,250.00	9.5 acres, 2.25 miles
USFWS Partners Program	Federal Agency	Restoration	Equipment: Skid steer, trailer, transport	0	0	0	\$10,000.00	0	10,000.00	10 acres, 3 miles
Total Contribution				\$43,000.00	\$66,750.00	\$128,000.00	\$22,000.00	\$500.00	\$260,250.00	10 acres, 3 miles

V. PROJECT EVALUATION QUESTIONS

1. What are the GPS Coordinates for the Project site (please use UTM NAD 83):

Lower Bound: 643579.41 Easting, 4271721.78 Northing

Upper Bound: 642645.28 Easting, 4269551.90 Northing

UTM Zone 17

2. List the type of Project that will be implemented (protection, enhancement, restoration; see definitions in the Appendix A). This will be a Restoration project.

3. Are Brook Trout currently present at the Project site or have access to the Project site? If not, were Brook Trout historically present? Brook Trout are currently present at the restoration project site, and throughout the Thorn Creek watershed. We expect brook trout to be present in the South Branch main-stem, in which they are currently listed as non-present. We have anecdotal information that the tributaries of the South Branch have brook trout. Our request includes robust monitoring efforts, working side by side with the WVDNR, to survey and document presence/absence of brook trout.

4. Please describe how the project will conserve Brook Trout and/or its habitat?

This project will conserve brook trout in two ways:

1) Restore a degraded 3 mile section of in-stream and riparian habitat in a spring fed native brook trout stream. An increased amount of pools and runs will serve as vital refuge, forage, and spawning habitat. Stabilizing eroding stream banks, reconnecting flood plains and restoring riparian areas will reduce sediment, nutrients, and solar gain. These efforts will maintain and strengthen the integrity of brook trout populations in the Thorn Creek and South Branch. By restoring the lower segments of Thorn Creek where water temperatures remain cold, it will allow Thorn to serve as a large nursery habitat for brook trout migrating into the South Branch.

2) A comprehensive monitoring program will establish the presence/absence, density and basic habitat conditions of the uppermost South Branch Watershed in West Virginia. TU and WV DNR will work together to provide mainstem fish surveys and tributary fish and habitat surveys. The information will provide a basis for further brook trout management options in both the mainstem and each individual tributary. The tributary survey will establish restoration needs, gauge landowner interest and set the stage for future, systematic restoration efforts. If brook trout are found in the mainstem, we will be able to confidently increase occupied patch metrics.

5. Is the Project site located on/along private or public land? Is the land currently under any form of protection (e.g. conservation easement)? This restoration project is located on both public (.75 mile) and private land (2+ miles). The WMA is cooperatively managed by the WV Division of Natural Resources and the Nature Conservancy, and is protected in perpetuity. TU will work with adjacent landowners to facilitate perpetual conservation easements once the private lands restoration work is complete. One landowner has expressed interest in allowing public access provided catch and release regulations enacted upon the WMA reach can be extended to his lands. TU will support this concept and facilitate the discussion between

WVDNR Wildlife and WV's Conservation Enforcement leadership to expand fishing opportunities along this section of stream.

6. What percentage of the watershed above the Project site is protected in perpetuity?

Only a small percentage of the watershed (6.8%) is statutorily protected by deed restrictions and conservation easement. Other than the subject site on the WMA, there is no public property above the project. However, the local community is not only aware of, but strongly protective of the brook trout.

7. List the specific EBTJV range-wide habitat goal(s) and objective(s) addressed by the Project and describe how the Project will contribute towards achieving them (refer to the list of EBTJV range-wide habitat goals and objectives in the Appendix B).

GOAL	OBJECTIVE
Increase the average size (km ²) of wild Brook Trout patches, which is currently 19 km ²	Increase the size (km ²) of 30 wild Brook Trout patches by the year 2022.
Maintain the current number of wild Brook Trout patches (i.e. no net loss)	Retain at least 6,022 allopatric wild Brook Trout patches (1.1) across the EBTJV geographic range by the year 2022.

This project will restore brook trout habitat through the installation of large wood and rock structures along 3 miles of Thorn Creek- including the Division of Natural Resource's "Fly Fishing Only Catch and Release Section" and two adjacent private properties. Brook trout population size and individual growth rates are currently limited in this reach due to a dearth of suitable habitat. Robust spring influences throughout the main stem make this section of Thorn Creek potentially one of the most productive brook trout nurseries in the state of West Virginia; however productivity is limited by the lack of suitable habitat. Restoration of this habitat will lift the carrying capacity of this watershed, which will allow brook trout to move throughout the upper South Branch Watershed.

The project will add occupied brook trout patches by providing documentation of the existence of brook trout within the upper reaches of West Virginia's South Branch of the Potomac River. If, as expected, brook trout are documented within the upper reaches of WV's South Branch, the resulting occupied patch would include all of the South Branch Valley from the mouth of Smith Creek to the headwaters of the South Branch near Headwaters, Virginia, documenting a contiguous occupied brook trout patch of about 175 square miles.

8. List the EBTJV key conservation action(s) the Project addresses (refer to the list of EBTJV key conservation actions in the Appendix C).

- Increase recreational fishing opportunities for wild Brook Trout

- Conserve and/or increase habitats that support robust wild Brook Trout populations
- Restore and reconnect suitable habitats adjacent to robust wild Brook Trout populations
- Conserve genetic diversity of wild Brook Trout populations
- Minimize threats to wild Brook Trout populations (e.g., degraded water quality, invasive species, altered hydrologic regimes)

9. What are the EBTJV Feature ID# and Classification Code for the catchment(s) where the Project work will be implemented (see Appendix D for a description on how to determine both items)?

- Catchment Feature ID#: 8423048
- Catchment Classification Code: 1.1

10. Will the Project result in re-establishing wild Brook Trout within the catchment?

Brook trout are currently present in the watershed; however, the ecological lift provided from this restoration effort will provide a greater source population that will expand the South Branch of the Potomac River brook trout patch further downstream from the Virginia/West Virginia border.

11. Is/are the catchment(s) where the Project work will be implemented located in a Wild Trout Patch; if so what is the Wild Trout Patch Feature ID# and Classification Code (see Appendix E for a description on how to determine both items)?

- Wild Trout Patch Feature ID#:8423048
- Wild Trout Patch Classification Code: 1.1

12. Will the Project benefit any federally listed threatened or endangered species or FWS priority species (refer to the list of FWS priority species for Region 4 and Region 5 in Appendix F)?

This project will benefit the American eel (*Anguilla rostrata*) and brook trout (*Salvelinus fontinalis*), which are FWS priority species, through the restoration of instream and riparian habitat, particularly through the addition of large wood. Riparian restoration and tree plantings will benefit three federally listed threatened or endangered species: the Virginia big-eared bat (*Corynorhinus townsendii virginianus*), the northern long-eared bat (*Myotis septentrionalis*), and the Indiana bat (*Myotis sodalis*).

13. Will the Project benefit any state listed threatened or endangered species or species of greatest conservation need?

Restriction of livestock from riparian areas coupled with riparian plantings and floodplain and instream wood additions will benefit the follow species listed on West Virginia's Wildlife Action Plan: Wood turtle (*Glyptemys insculpta*), spotted turtle (*Clemmys guttata*), Seal salamander (*Desmognathus monticola*), and the Jefferson Salamander (*Ambystoma jeffersonianum*).

14. What are the root causes of degradation in the catchment(s) where the Project is located and which of these are addressed by the Project?

Agricultural land use, specifically livestock access to the riparian areas, is one of the primary causes of degradation in the watershed. Allowing farm stock access to the stream results in nutrient introduction, which increases the biological oxygen demand (BOD), thereby reducing dissolved oxygen in the system. Tree cover along the stream is sparse allowing insolation, warming and further decreasing the carrying capacity of dissolved oxygen. Flood rehabilitation work in the 1950's removed the complexity of habitat structure in the reach. Incised channels increase scour to bedrock levels and clearing land for livestock use has also limited the amount of large wood available for recruitment to the stream channel, which has prevented the 're-loading' of diminished habitat suitable to brook trout.

This project will address this degradation in the following ways:

- 1) restricting livestock access to riparian areas on private land reduces the BOD
- 2) restoring riparian areas through plantings on public and private lands provides the short-term shade that will reduce stream insolation and warming and in the long term will provide seed stock and source materials for natural wood loading to occur,
- 3) restoring instream habitat through streambank stabilization and large wood additions will restore the habitat complexity, cover habitat, and sort sediment on both public and private lands,
- 4) re-connecting the flood plain by perforating artificial berms will reduce channel scour conditions, provide flood plain services, and reduce the stress on structures placed in the stream.

15. Describe the plans for measuring the Project's success in meeting its goals and objectives.

TU will work with the WV DNR to provide comprehensive baseline fishery, benthic and habitat condition surveys using USFS protocols for consistency with adjacent work on federal lands. This information will be used to determine the conditions prior to the restoration work. TU will replicate this work immediately after the construction phase is completed, and then again at 6 months and then annually for three years (beyond the scope of this agreement). This information will allow for adaptive management and corrective actions as needs are realized. Genetics and radio telemetry surveys will also be conducted to determine brook trout patch expansion into the South Branch, in an effort to verify the presence of both fluvial and resident natured fish in the drainage.

16. Does the Project support any goals in existing action plan(s) (e.g. state fish & wildlife, watershed protection, water quality improvement, land or water-use plan(s), or other regional plan(s))?

This project supports the following action plan goals:

- Chesapeake Bay Watershed Agreement Goals and Objectives for: Healthy Watersheds, Fish Habitat, Stream Health, Forest Buffers, Fish Passage, Climate Adaptation, Citizen Stewardship, and Local Leadership. Specifically, Thorn Creek is listed as a priority sub-watershed in their Brook Trout Management Plan.
- West Virginia Division of Natural Resource's Wildlife Action Plan

- West Virginia's Watershed Implementation Plan Phase II goals: increased installation of riparian buffers, increased installation of non-urban stream restoration and natural stream channel design projects, and increased staff for Farm Bill Financial Assistance program outreach, conservation planning, technical assistance, and implementation.
- National Fish and Wildlife Foundation's Eastern Brook Trout Business Plan and Conservation Portfolio
- Trout Unlimited's restoration of Thorn Creek
- WV DNR's work to improve angling opportunities on state lands and the economic opportunities afforded by sales of licenses, especially out of state licenses, for the privilege of fishing this amazing area.
- The EBTJV's goals for increasing the occupied patches, size of average occupied patch, and access to high quality brook trout angling.

17. Are there invasive fish species within the Project site or have access (no barrier) to it?

There are currently no invasive fish species within the project site. Thorn Creek maintains its connectivity with the South Branch of the Potomac, and thus invasive species introduction into this larger watershed could make their way into the project area, though spatial separation and a short and steep waterfall at the confluence of Thorn Creek with the South Branch makes this unlikely. Within the South Branch, there are non-native fishes, including non-native salmonids, but we expect to document native strain brook trout since the last time this stream was comprehensively surveyed in the 1990's. We are not proposing any implementation dollars for the South Branch at this time, but are requesting earnest support to provide this survey work on the South Branch in conjunction with the WV DNR.

18. Are hatchery-reared salmonids stocked at the Project site or that have access (no barrier) to it?

No hatchery reared salmonids are stocked within the project site. Hatchery reared salmonids are stocked into the main stem of the South Branch up the Potomac upstream and downstream of the confluence with Thorn Creek. However, heavy fishing pressure during stocking time and the significant distance from stocked locations diminishes the likelihood of infiltration by hatchery reared salmonids. An approximately 10 foot high natural cascade serves as an impediment to hatchery stocked fish from entering Thorn Creek watershed.

19. Please describe the current status of the Project. Is it planned, permitted, and ready to begin?

TU has restoration project experience within this watershed with landowners and the partners. Our systematic approach will provide the timing to survey, design, permit, and implement the work within a two year window, and possibly in one year depending on our work load. For monitoring, TU and the DNR have extensive experience in benthic, habitat

and fisheries monitoring on public and private lands. Since 2012, TU has used the designated protocols on more than 100 sites on USFS lands and more than 20 on private lands. We will follow the guidance of WV DNR's trout program for the work on the mainstem of the South Branch, and will determine the best method for tributary sampling based on the preliminary survey work we accomplish through TU's private lands program outreach efforts. This project has been planned, but is not yet permitted.

20. Will public access be allowed at the Project site? If so, what kinds of recreational activities are allowed – fishing, hiking, camping, wildlife viewing, etc.?

The restoration work will take place on private and public lands. The 528 acre Thorn Creek Wildlife Management Area is open to fishing, hiking, hunting, and wildlife viewing. It is the only land currently available to the public within the Thorn Creek watershed. The private lands adjacent to the Thorn Creek WMA are currently not available to the public, but could be if the Fly-fishing only, Catch and Release regulation in place on the WMA were extended to these lands and enforced in similar fashion by the Conservation Officers of the WV DNR. Public access is provided on the South Branch, where no current information on brook trout presence has been generated.

21. Will the Project improve recreational fishing opportunities for wild Brook Trout? If so, please describe the improvement and how the improvement will be measured?

The current condition of Thorn Creek's sole public access is less than optimal. The WMA contains approximately $\frac{3}{4}$ mile of accessible fishing, but the habitat conditions and fishing is limited to a short, 200 yard, optimal fishing reach. BY increasing the cover, forage and bug production habitat, this project will enhance the current good fishing area, and expand the fishing throughout the entire $\frac{3}{4}$ mile section.

The adjacent land are subject to become a contiguous 3 mile section of accessible angling with certain conditions, which TU and the DNR should support, allowing for the expansion of the current catch and release regulations for brook trout. By increasing the number of miles of access along Thorn Creek it raises the amount of highest quality fishing opportunities in the state of WV by 10 fold.

Stream reaches above, below, and within our project site will be sampled before and after project completion, during the same time each year, with assistance from the WVDNR to assess changes in the abundance and size structure of the brook trout population. Through this project, this section of Thorn Creek will support a trophy brook trout fishery.

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22. Please describe the outreach or educational components associated with the Project.

This project will include a robust portion of both outreach and education. First, by working side by side with the WV DNR, TU will share its knowledge base, assets, and know how to demonstrate how sustainable restoration can be accomplished. This is an admitted need for

the DNR. Second, to educate anglers on the need for additional restoration work, and the value of the work on this site, we will design and install signage along the WMA reach to educate the users. Third, our TU blog, Facebook site and web presence will highlight this work and the contributions of the funders, landowners, partners and sponsors.

Fourth, TU will be using the “Adopt a Trout Program,” where trained staff will employ radio telemetry gear and pit tags to track brook trout movement through the watershed. These data will be collected, analyzed, and reported back to local school children and partners who will be engaged in watching these movements seasonally. This project will help show local communities how much these fish move, and the importance of interconnected stream systems.

23. Please describe how this Project lessens the effects of climate change on Brook Trout.

Within the project site, we are reducing insolation, increasing cover and shade in the stream, increasing pool and drought refugia, and bug production areas within the riffles. The natural resilience of the spring fed waters of Thorn Creek, which boasts >20 springs producing >200 gallons per minute, including one at the top of the project reach which produces 1500 gallons per minute, provides natural resilience and adequate temperatures. The restoration work will enhance the temperature regime to extend cold water downstream, eventually cooling the South Branch main-stem and increasing the range of adequate temperatures to support cold water species. By re-connecting flood plains, the system will become more resilient to flashiness, and will maintain more stable flows.

24. Please explain how this Project is a good investment of funds, particularly in terms of its recreational and/or economic value.

TU is asking for less than \$50,000 to restore $\frac{3}{4}$ mile of public, high quality fishing to its optimal end point. Coupled with the work immediately upstream and downstream, this work is expected to result in more than 3 times the currently available public accessible fishing opportunities on Thorn Creek. Using standard return per mile of fishing numbers, \$40,000.00/mile (Shingleton 2007¹), our investment will be repaid within the first year it is open, and every year it remains in place. This does not consider the fact that Thorn Creek is currently renowned as a brook trout destination throughout the state and region, with ‘pent up demand’, but for a lack of fishing opportunity, except in the degraded WMA section. An additional benefit is the benefit of providing an ample source of brook trout for the South Branch system above Franklin WV and into the Virginia section. This source of brook trout, some of which are greater than 15 inches, will continue to provide natural, cost-free stock resulting in a perpetual source for the Upper South Branch. Finally, our monitoring is expected to fill in gaps of knowledge about our fishery, guiding future decisions on how to restore, enhance, and reconnect certain tributaries to the main-stem in a systematic and logical order. We will be able to leverage the monitoring work into meaningful actions on the ground.

Shingleton, Mike. Public Affairs Reporter. Personal Communication with Rob Stenger, Downstream Strategies. Published in 2007.

Appendix A

Definitions

Protection: Conservation actions that maintain, or prevent the decline of, aquatic habitat.

Enhancement: Conservation actions that heighten, intensify, or improve specific functions of aquatic habitat.

Restoration: Conservation actions that return natural/historic attributes or functions to aquatic habitat.

Appendix B

EBTJV Range-wide Habitat Goals and Objectives

GOAL	OBJECTIVE
Increase the average size (km ²) of wild Brook Trout patches, which is currently 19 km ²	Increase the size (km ²) of 30 wild Brook Trout patches by the year 2022.
Restore wild Brook Trout to catchments where they were extirpated	Establish wild Brook Trout in 15 extirpated catchments by the year 2022.
Maintain the current number of wild Brook Trout patches (i.e. no net loss)	Retain at least 6,022 allopatric wild Brook Trout patches (1.1) across the EBTJV geographic range by the year 2022. Retain at least 3,838 sympatric wild Brook Trout patches (1.2, 1.3, and 1.4) across the EBTJV geographic range by the year 2022.
Increase connectivity within and among wild Brook Trout catchments	Complete Aquatic Organism Passage projects within 45 wild Brook Trout catchments by 2022.

Appendix C

EBTJV Key Conservation Actions

- Increase recreational fishing opportunities for wild Brook Trout
- Conserve and/or increase habitats that support robust wild Brook Trout populations
- Restore and reconnect suitable habitats adjacent to robust wild Brook Trout populations
- Conserve genetic diversity of wild Brook Trout populations
- Conserve unique wild Brook Trout life history strategies (e.g., lacustrine populations, large river populations, and coastal populations).
- Minimize threats to wild Brook Trout populations (e.g., degraded water quality, invasive species, altered hydrologic regimes)

Appendix D

To determine the EBTJV Feature ID# and Classification Code for the catchment where your Project work will be implemented, please follow these steps:

1. Click on this [Brook Trout Integrated Spatial Data and Tools](#) link;
2. Put a $\sqrt{\quad}$ mark in the box next to the Legend label EBTJV Classified Catchments to display this data layer;
3. Locate the catchment where your Project work will be implemented; you can increase or decrease the map scale by selecting the appropriate map scale (see drop down menu located in the lower left hand corner) or use the wheel on your mouse. You can also change the layer's transparency by clicking the yellow light icon that is associated with this layer in the Legend and sliding the opacity bar.
4. Once you have located the Project's catchment, find the Identify Features button at the top of the page (hovering your cursor over each button will identify its function). Open the drop down menu for this function and select the EBTJV Classified Catchments layer, and then click the Identify Features button once to turn it on.
5. Next move your cursor within the boundary of the project's catchment and click once. A Feature Information box will appear on your screen and you will see the catchment's "featureid" number and "ebtjv_code". Record both numbers in the appropriate locations in the Project Application Form.

Appendix E

To determine the EBTJV Wild Trout Patch Feature ID# and Classification Code for the catchment where your Project work will be implemented, please follow these steps:

1. Click on this [Brook Trout Integrated Spatial Data and Tools](#) link;
2. Put a $\sqrt{\quad}$ mark in the box next to the Legend label Wild Trout Habitat Patches to display this data layer;
3. Locate the catchment where your Project work will be implemented; you can increase or decrease the map scale by selecting the appropriate map scale (see drop down menu located in the lower left hand corner) or use the wheel on your mouse. You can also change the layer's transparency by clicking the yellow light icon that is associated with this layer in the Legend and sliding the opacity bar.
4. Once you have located the Project's catchment, find the Identify Features button at the top of the page (hovering your cursor over each button will identify its function). Open the drop down menu for this function and select the Wild Trout Habitat patches layer, and then click the Identify Features button once to turn it on.
5. Next move your cursor within the boundary of the Project's catchment and click once. A Feature Information box will appear on your screen and you will see the catchment's "feat_id" number and "ebtjv_code". Record both numbers in the appropriate locations in the Project Application Form.

Appendix F

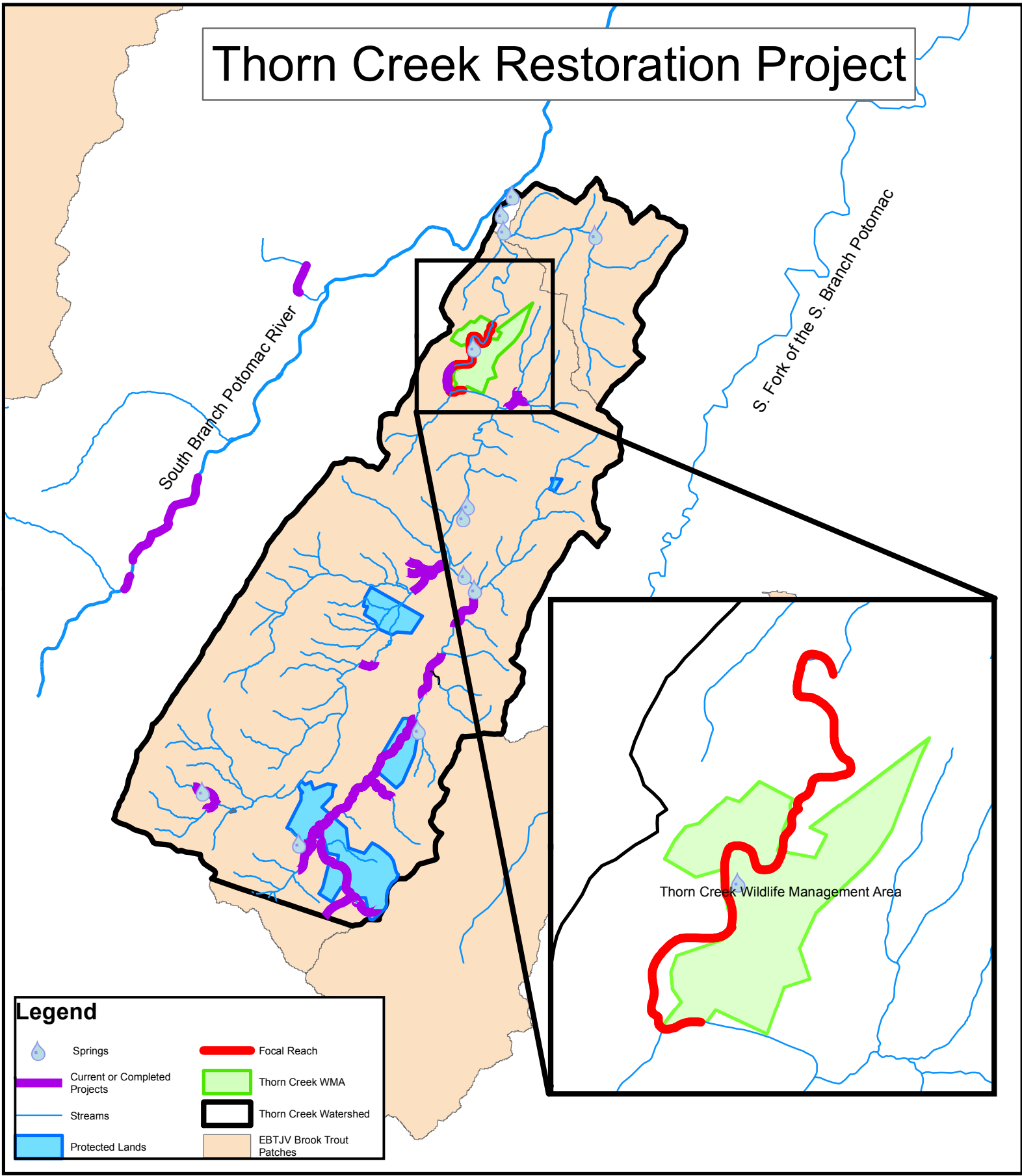
FWS Priority Species

	R5	R4
Acipenser brevirostrum, Shortnose Sturgeon	x	x
Acipenser fluvescens, Lake Sturgeon	x	x
Acipenser oxyrinchus, Atlantic Sturgeon	x	
Acipenser oxyrinchus, Atlantic Sturgeon - Carolina DPS		x
Acipenser oxyrinchus, Atlantic Sturgeon - Chesapeake Bay DPS	x	
Acipenser oxyrinchus, Atlantic Sturgeon - Gulf of Maine DPS	x	
Acipenser oxyrinchus, Atlantic Sturgeon - New York Blight DPS	x	
Acipenser oxyrinchus, Atlantic Sturgeon - South Atlantic DPS		x
Acipenser oxyrinchus desotoi, Gulf Sturgeon		x
Alasmidonta heterodon, Dwarf Wedgemussel	x	
Alosa aestivalis, Blueback Herring	x	x
Alosa alabamae, Alabama Shad		x
Alosa mediocris, Hickory Shad	x	x
Alosa psuedoharengus, Alewife	x	
Alosa sapidissima, American Shad	x	x
Ablema neislerii, Fat Threeridge		x
Ambystoma bishopi, Reticulated Flatwoods Salamander		x
Ambystoma singulatum, Flatwoods Salamander		x
Anguilla rostrata, American Eel	x	x
Atractosteus spatula, Alligator Gar		x
Cambarus hartii, Piedmont Blue Burrower		x
Crassostrea virginica, Eastern Oyster		x
Cryptobranchus alleganiensis bishopi, Ozark Hellbender		x
Crystallaria asprella, Crystal Darter		x
Crystallaria cincotta, Diamond Darter	x	
Cynoscion nebulosus, Spotted Seatrout		x
Cyprinella callitaenia, Bluestripe Shiner		x
Cyprogenia stegaria, Fanshell	x	
Elliptio chipolaensis, Chipola Slabshell		x
Elliptio purpurella, Inflated Spike		x
Elliptoideus sloatianus, Purple Bankclimber		x
Epioblasma capsaeformis, Oyster Mussel	x	
Epioblasma torulosa rangiana, Northern Riffleshell	x	
Erimonax monachus, Spotfin Chub		x
Erimystax cahni, Slender Chub	x	
Etheostoma boschungii, Slackwater Darter		x
Etheostoma chienense, Relict Darter		x
Etheostoma moorei, Yellowcheek Darter		x

Etheostoma okaloosae, Okaloosa Darter		x
Etheostoma percnurum, Duskytail Darter	x	x
Etheostoma raneyi, Yazoo Darter		x
Etheostoma sellare, Maryland Darter	x	
Etheostoma sp., Bluemask Darter		x
Fundulus julisia, Barrens Topminnow		x
Ictalurus punctatus, Channel Catfish		x
Lampsilis subangulata, Shiny-rayed Pocketbook		x
Lampsilis virescens, Alabama Lampmussel		x
Lasmigona decorata, Carolina Heelsplitter		x
Lepomis aurius, Redbreast Sunfish		x
Lepomis macrochirus, Bluegill		x
Lepomis microlophus, Redear Sunfish		x
Limulus polyphemus, Horseshoe Crab	x	
Margaritifera hembeli, Louisiana Pearlshell		x
Marstonia castor, Beaverspond Marstonia		x
Medionidus penicillatus, Gulf Mocassinshell		x
Medionidus simpsonianus, Ochlockonee Mocassinshell		x
Micropterus cataractae, Shoal Bass		x
Micropterus dolomieu, Smallmouth Bass		x
Micropterus henshalli, Alabama Spotted Bass		x
Micropterus punctulatus, Spotted Bass		x
Micropterus salmoides, Largemouth Bass		x
Morone chrysops, White Bass		x
Morone saxatilis, Striped Bass	x	x
Moxostoma robustum, Robust Redhorse		x
Moxostoma sp., Sicklefin Redhorse		x
Noturus flavipinnis, Yellowfin Madtom	x	x
Oncorhynchus clarkii, Cutthroat Trout		x
Oncorhynchus mykiss, Rainbow, Steelhead, Redband Trout		x
Percina caprodes, Logperch		x
Percina jenkinsi, Conasauga Logperch		x
Percina rex, Roanoke Logperch	x	
Percina sp. cf. palmeris, Halloween Darter		x
Percopsis omiscomaycus, Trout-Perch		x
Phencobius mirabilis, Suckermouth Minnow		x
Phoxinus cumberlandensis, Blackside Dace	x	
Pleurobema clava, Clubshell	x	
Pleurobema collina, James River Spiny mussel	x	
Pleurobema pyriforme, Oval Pigtoe		x
Polyodon spathula, American Paddlefish		x

Potamilus capax, Fat Pocketbook		x
Procambarus econfinae, Panama City Crayfish		x
Pteronotropis euryzonus, Broadstripe Shiner		x
Pylodictus olivaris, Flathead Catfish		x
Quadrula sparsa, Appalachian Monkeyface Pearlmussel	x	
Rachycentron canadum, Cobia		x
Salmo salar, Atlantic Salmon	x	
Salmo salar, Atlantic Salmon, GOM DPS	x	
Salmo trutta, Brown Trout		x
Salvelinus fontinalis, Brook Trout	x	x
Salvelinus namaycush, Lake Trout	x	x
Sander canadensis, Sauger		x
Sander vitreus, Walleye		x
Scaphirhynchus albus, Pallid Sturgeon		x
Scaphirhynchus platyrhynchus, Shovelnose Sturgeon		x
Scaphirhynchus suttkusi, Alabama Sturgeon		x
Sciaenops ocellatus, Red Drum		x
Scomberomorus maculatus, Spanish Mackerel		x
Villosa fabalis, Rayed Bean	x	
Villosa perpurpurea, Purple Bean	x	

Thorn Creek Restoration Project



0 1.25 2.5 5 7.5 10 Miles





DIVISION OF NATURAL RESOURCES
324 4th Avenue, Room 342
South Charleston, West Virginia 25303-1228
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Fax (304) 558-2768
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Jim Justice
Governor

Stephen S. McDaniel
Director

September 22, 2017

Stephen G. Perry, Coordinator
Eastern Brook Trout Joint Venture
350 Hunkins Pond Road
Sanbornton, NH 03269

Dear Mr. Perry:

The WV DNR supports the proposal submitted by Trout Unlimited to improve habitat conditions within and adjacent to the Thorn Creek Wildlife Management Area's (WMA) public fishing stream reach. This section is the only public land available to anglers in the Thorn Creek watershed. Thorn Creek is one of West Virginia's prime native trout streams but the public fishing area is lacking adequate cover and forage habitat. The proposed project would enhance the stream's native trout population.

Trout Unlimited's West Virginia staff is familiar with the stream and its agricultural community and is uniquely positioned to implement this work. TU's staff and the WVDNR are partnering on this project, as well as others, to raise awareness and habitat conditions for native trout.

The work on the WMA will be augmented by work on the adjacent private lands to improve the reach above and below the WMA and will enhance the public fishing opportunity. This stream serves as the source population for the repopulation of the upper South Branch of the Potomac, and this will benefit the WMA and upper South Branch reaches of the watershed. Thorn Creek Wildlife Management Area is a popular destination for anglers from across the region. Continued habitat improvement in this watershed will also provide anglers with memorable experiences into the future.

The DNR is committed to working with Trout Unlimited to improve the experience of all anglers who utilize the natural resources of West Virginia. Partnering with Trout Unlimited will expand our capacity to implement stream restoration within this watershed and across the state, benefitting the resource and anglers.

Thank you for the Eastern Brook Trout Joint Venture consideration of the proposal.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephen S. McDaniel".

Stephen S. McDaniel
Director

SSM/bp



United States Department of the Interior

FISH AND WILDLIFE SERVICE



West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

September 19, 2017

Stephen G. Perry, Coordinator
Eastern Brook Trout Joint Venture
350 Hunkins Pond Road
Sanbornton, NH 03269

Dear Mr. Perry,

The US Fish and Wildlife Service (USFWS) would like to express its support for Trout Unlimited's (TU) Eastern Brook Trout Joint Venture/National Fish Habitat Action Plan Project proposal. TU's proposal to restore in-stream habitat and riparian areas on and adjacent to Thorn Creek Wildlife Management Area will enhance critical brook trout nursery habitat, thus bolstering brook trout abundance ensuring the long-term sustainability of this unique fluvial population. Karst geology underlying the Thorn Creek watershed supplies an abundance of cold water through numerous robust spring sources, creating stretches of optimal water temperatures from the extreme headwaters to the mouth of Thorn Creek. TU and USFWS are long time partners in West Virginia and collaborate on conservation efforts through the Partners for Fish and Wildlife Program. Our joint efforts allow us to provide technical assistance on stream and riparian restoration and implement a suite of conservation practices at a low cost to landowners, both public and private. Through this initiative, TU and the USFWS co-sponsor a Conservation Crew who work with local farmers and landowners, which installs riparian fencing, alternative off stream water sources, fish friendly armored stream crossings, in-stream habitat projects, aquatic organism passage projects, and riparian plantings. To date, our shared full time six- person Conservation Crew has installed nearly two million feet of agricultural exclusion fencing, completed 10 miles of in-stream restoration projects, and completed 6 aquatic organism passage projects. This joint effort has led to the protection of hundreds of stream miles and hundreds of acres of sensitive riparian and upland habitat. TU's persistent outreach efforts have allowed us to link continuous projects, creating sizable hubs of conservation that span across public and private lands to maximize ecological uplift and confer the greatest benefit to brook trout.

Trout Unlimited and the Partners Program have completed numerous conservation projects in the headwaters of Thorn Creek, and currently have additional applications for in-stream and riparian restoration on over four miles of stream in the watershed. Funding provided through this grant would allow this partnership to build upon its current success in the watershed and focus additional efforts both on and adjacent to public access points to improve angling opportunities. This project will provide a vital link in the completion of the Thorn Creek project and will restore the

connection between the main stem Thorn Creek patch of brook trout and the Upper South Branch of the Potomac Watershed. We look forward to working with TU in the future to build upon our prior successes. Please contact me or Nick Millett at 304-636-6586 if you have any questions regarding this correspondence.

Sincerely,



John E. Schmidt
Field Supervisor



United States Department of Agriculture
Natural Resources Conservation Service
1205 Petersburg Pike
Franklin, WV 26807
(304) 358-2285 (Phone)
(855) 857-6450 (Fax)

September 19th, 2017

Dear Mr. Perry,

I would like to express support for Trout Unlimited's (TU) proposal to the Eastern Brook Trout Joint Venture's 2018 grant program. Through this proposal, TU seeks to build upon their successful brook trout habitat restoration efforts in the Thorn Creek watershed by restoring habitat on and directly above and below the West Virginia Division of Natural Resource's Thorn Creek Wildlife Management Area "Fly Fish Only-Catch and Release" section. TU and the NRCS have successfully implemented comprehensive, watershed-wide habitat restoration initiatives in several watersheds in the Potomac headwaters. TU's robust outreach efforts, technical expertise, and implementation capabilities have garnered them broad support from an array of landowners and state and federal agencies. This support has allowed them to restore in-stream and riparian habitat throughout the Thorn Creek Watershed on private lands. TU has also garnered applications for conservation practices on an additional four miles of stream, including properties directly adjacent to the Thorn Creek Wildlife Management Area. TU's efforts strongly complement the NRCS's efforts to promote the adoption and implementation of practices that improve water quality, soil resiliency, and fish and wildlife habitat through Farm Bill Programs. TU uses the brook trout to inspire conservation on private properties where other state and federal agencies have been denied.

Trout Unlimited and the NRCS have a strong long term partnership and now co-sponsor three positions: two stream restoration specialists and one conservation planner. Our partnership with Trout Unlimited has fostered the expansion of our technical planning and design capacity to aid farmers and local landowners in conservation implementation. Trout Unlimited has continually proven that they are able to deliver quality conservation projects at a competitive cost, making the adoption of conservation practices by land owners an easy choice. We look forward to continuing our partnership with TU in the future. The NRCS would like to show vast support of their effort to restore the only publicly owned section of Thorn Creek through this grant proposal.

Please do not hesitate to contact me regarding USDA programs or our working relationship with TU.

Sincerely,

Doris Brackenrich
District Conservationist
Grant, Hardy, and Pendleton Counties
Phone: 304-578-9131

From: Preston, Bret A <Bret.A.Preston@wv.gov>

Sent: Friday, September 22, 2017 2:52 PM

To: Dustin Wichterman; Thorne, David W

Cc: Gary Bertj; Cory Trego

Subject: RE: WVDNR Letter of Support

Folks,

I have prepared the letter of support to Steve Perry for the Director's signature and it is in his office. If I get it to you Monday will that work? Thanks!

Bret





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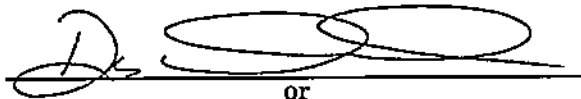
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Product Description (image number, subject, horizontal/vertical, location, title, etc.):

DSC_0062 (horizontal image of Thorn Creek) and DSC_0073 (horizontal image of Thorn Creek project reach)

Name: Dustin Wichterman

Address: 1777 North Kent Street, Arlington, VA 22209

Phone: 304-614-5709

Signature: 

Date: 9/22/2017

