

**Attachment D**

**Project Number: 2104**

**Bachman Run – Bachman and Horst Properties Stream Restoration Project  
(Design and Permitting)**

Doc Fritchey Trout Unlimited

SAP Vendor: #140471

P.O. Box 227  
Palmyra, PA 17078

Howard McGarvey  
[trip@dfu.org](mailto:trip@dfu.org)

Trish Attardo  
[pattardo@pa.gov](mailto:pattardo@pa.gov)

**Grant Request: \$161,081**

Project Location:  
Bachman Run – Quittapahilla  
HUC 12: 020503050802

Assessment ID: 17168  
ATTAINS Assessment Unit ID: PA-SCR-56400313

Latitude: 40.289517  
Longitude: -76.493789

**Goal 1: A Cleaner, Healthier Environment**  
**Objective 1.2: Provide for Clean and Safe Water**

**I. Context**

**A. Please explain how the proposed project fits within the current version of the PA Nonpoint Source Management Plan.**

Section 319 Nonpoint Source Management grant funds are provided to implement nonpoint source management plans and activities identified in Pennsylvania's WIP watersheds. These grants fund activities focused on nonpoint source pollution identified by the Pennsylvania Nonpoint Source Management Plan. The Plan includes three objectives that directly relate to our objectives and activities in the Quittapahilla Watershed: reducing nitrogen, phosphorus and sediment pollutant loads by implementing stream and floodplain restoration projects and planting riparian buffers.

The three objectives from the 2019 Nonpoint Source Management Plan that would be addressed by this project are:

Objective 2.1 Implement BMPs on 30 agricultural operations per year using state directed funds. These BMPs will be for the mitigation of soil loss and/or nutrient management.

Objective 3.4 Implement 30 new, state-funded riparian buffer, stream restoration and/or stormwater management projects annually for the next five years.

Objective 3.6 Support, using state managed funds, the completion of 15 miles of stream restoration and/or bank stabilization projects over the next five years.

The Total Maximum Daily Loads (TMDLs) Report (PADEP, 2000) cites excessive sediment and nutrient levels as a major water quality problem in the Quittapahilla Creek Watershed. The report indicates that these pollutants are causing increased algae growth, large accumulations of fine sediments on the streambed, and degradation of in-stream habitat. The excessive sediment and nutrient levels are attributed to agricultural activities, urban runoff and stream bed and bank erosion. The 2018 Integrated Water Quality Report lists this reach of Snitz Creek as impaired with the source of impairment being crop related agriculture and the cause of impairment being siltation.

The Quittapahilla Creek Watershed Implementation Plan identified projects focused on stream bed and bank erosion and impacts associated with agricultural operations. The WIP includes nitrogen, phosphorus and sediment loading reduction estimates by subwatershed and loading reduction estimates by projects within subwatersheds. An implementation schedule was prepared that shows completion of all prioritized projects by 2030. This includes 69 projects in the subwatersheds and 19 projects along the mainstem Quittapahilla Creek.

Bachman Run is among the five subwatersheds covered by our WIP. The Bachman Run – Bachman and Horst Properties Stream Restoration Project represents an important next step in our continuing effort to implement those projects identified in our WIP for the Quittapahilla Creek watershed. It will significantly reduce nutrient and sediment loadings to the Bachman Run, Quittapahilla Creek and the Swatara Creek Watersheds and will ultimately help us meet the TMDL goals for both watersheds.

Given that priority is given to 319 grant applications that address nonpoint source pollution originating from agriculture, stormwater runoff, and stream channel degradation where the proposed project is identified in an existing Section 319 Watershed Implementation Plan, this project meets all of that criteria.

**B. Please explain how the proposed project supports other work in the watershed being performed under other grant programs.**

The Lebanon County Stormwater Consortium was formed by the City of Lebanon, Annville Township, Cleona Borough Authority, North Cornwall Township, North Lebanon Township and South Lebanon Township. In August 2017 they completed the draft of their Joint Pollutant Reduction Plan to meet

MS4 requirements. Their Plan includes proposed retrofits to existing urban BMPS, proposed new urban BMPs, as well as fourteen stream restoration projects along the mainstem Quittapahilla Creek.

In addition, USDA-NRCS and the Lebanon County Conservation District, have committed to work with the DFTU and QWA to implement stream restoration projects that were identified on farms in the Quittapahilla Creek Watershed Implementation Plan. They propose to utilize EQUIP funds supplemented by matching funds from other sources to design, permit and implement thirty-two restoration projects over the next 5 – 10 years.

**C. Please explain how the proposed project supports the implementation and completion of the Watershed Implementation Plan (WIP) in question.**

Our WIP prioritized five subwatersheds in the Quittapahilla Creek Watershed including Snitz Creek, Beck Creek, Bachman Run, Killinger Creek and the North Annville Tributary. This project represents our first restoration effort in the Bachman Run subwatershed. Our first projects in the Snitz Creek and Beck Creek subwatersheds were submitted for Water Quality Improvement Projects along the Sunoco Mariner East 2 Pipeline Corridor Grant Program in 2018. Those grant applications were approved in March, 2019. In addition, a 319 Non-Point Source Grant was approved for our second project in the Snitz Creek subwatershed in 2020. Design plan development and permitting are currently underway on these projects.

In the process of implementing the prioritized projects over the last several years, we have found that not all landowners want to participate in the restoration effort. Unfortunately, this has left gaps, at least for now, in the logical implementation sequence we intended to follow. At the same time the Quittapahilla Watershed Association and their partner, Doc Fritichey Trout Unlimited have been approached by a number of landowners in each of the priority subwatersheds who have expressed an interest in participating. Sticking with our intended implementation order would mean some landowners would be waiting for many years before we would actually reach their property. After consulting with Jineen Boyle and Scott Carney, PADEP we were encouraged to continue following our implementation schedule, but not to discourage or turn away landowners interested in participating, provided they were in a priority subwatershed and their property included a prioritized stream reach. Although Bachman Run ranked fourth of the five priority subwatersheds this current project involves two landowners that approached us in 2019 and are very interested in participating. Sticking with our implementation schedule would have meant we wouldn't even have applied for funding until Spring, 2028. By then conditions along their stream would have deteriorated significantly and they likely would have lost interest in working with us after being turned away.

**II. Program v. Watershed Project**

Project (Incremental)

**III. Content**

**A. Problem/Need Statement**

The 2018 Integrated Water Quality Report lists this reach of Bachman Run as impaired with the source of impairment being agriculture and the cause of impairment being nutrients.

The reaches along this part of Bachman Run were historically straightened. The results of a rapid geomorphic assessment conducted during the summer of 2019 indicated that the stream reaches through Bachman Property are laterally unstable due to meander redevelopment along some sections, livestock trampling throughout, and maintenance of riparian vegetation. The streambanks along the Bachman Property are mowed pasture grasses to top of bank with a narrow unmowed strip to edge of water. This area totally lacks trees or shrubs that would stabilize the banks and shade the channel. Stability problems include high width to depth ratio, bank erosion, heavy sedimentation, and aggradation (lateral and mid-channel bars).

Working with USDA-NRCS, the upper and lower stream reaches through the Horst Property have been fenced to limit livestock access and establish a riparian buffer varying in width from 5 to 10 feet. The vegetation in these areas is composed predominately of grasses and weeds. With the exception of three trees, this area also lacks trees or shrubs that would stabilize the banks and shade the channel. The streambanks along the upper and lower sections of the middle stream reach are also fenced establishing a riparian buffer varying in width from 5 to 20 feet. The middle section of the middle reach is adjacent to the house with the vegetation along the left banks consisting of mowed lawn and a minimal unmowed area along the right bank. Invasive plants are evident along the riparian buffers throughout. Although the channel is in the early stages of natural recovery, it is still overwide from previous livestock impacts with poor sediment transport, heavy sedimentation of the streambed and localized streambank erosion being the principal stability problems. Existing and former livestock crossing areas on both properties are in poor condition.

The streambank and streambed erosion along both properties is a source of sediment to downstream reaches along Bachman Run, Quittapahilla Creek, as well as Swatara Creek. The increased sedimentation has significantly degraded in-stream habitat resulting in few, shallow pools and riffles that are highly embedded with fine sediments.

The Quittapahilla Creek WIP identified projects focused on stream bed and bank erosion, as well as opportunities to provide water quality treatment for runoff from agricultural land. As noted, our objectives and activities in the Quittapahilla Watershed are consistent with the Pennsylvania Nonpoint Source Management Plan: reducing nitrogen, phosphorus and sediment pollutant loads by implementing stream and floodplain restoration projects and planting riparian buffers. The Bachman Run is among the five subwatersheds covered by our WIP. The Bachman Run – Bachman and Horst Properties Stream Restoration Project represents an important next step in our continuing effort to implement those projects identified in our WIP for the Quittapahilla Creek watershed. It will significantly reduce nutrient and sediment loadings to the Bachman Run, Quittapahilla Creek and the Swatara Creek Watersheds.

## **B. Goals and Objectives**

The Bachman Run – Bachman and Horst Properties Stream Restoration Project will restore 2,781 linear feet of in-stream and riparian habitat along the mainstem Bachman Run. This will reduce nitrogen, phosphorus and sediment loadings to Bachman Run from streambank erosion by 208.6 lbs./yr., 189.1 lbs./yr. and 124,811.3 lbs./yr., respectively. In addition, the project will convert heavily impacted pasture into 0.5 acres of emergent wetlands in the adjacent floodplain. This project is one of the many targeted projects that are part of a larger effort to improve water quality and in-stream habitat conditions in the Quittapahilla Creek Watershed. For Doc Fritchey Trout Unlimited, another goal is that the Quittapahilla be a year-round, self-sustaining fishery. This project is yet another step towards that goal.

Funding from this grant will allow us to prepare the restoration design plans and to obtain local, state and federal permits for this project.

## **C. Project Description**

### Restoration Approach

Stream restoration for these reaches of the Bachman Run will utilize a natural channel design approach that includes: sediment removal along areas with heavy sedimentation; adjustments to unstable meander geometry; regrading steep banks; installing toe wood, log and boulder structures to stabilize streambanks and create in-stream habitat; adjusting the location of livestock fencing to increase undisturbed riparian buffer width; upgrading and stabilizing existing livestock crossings; invasive plant removal; and establishing a 35 foot riparian buffer with plantings of native trees and shrubs. The restoration approach includes:

- Bachman Property

- Adjust meander geometry to eliminate tight bends;
- Narrow the bankfull and base flow width along overwide channel sections by installing bankfull benches to improve sediment transport;
- Increase pool to riffle ratio by excavating deep pools and constructing cobble-gravel riffles with boulder grade control;
- Install toe wood and soil lifts, log and several boulder structures to stabilize streambanks and create in-stream habitat including overhead cover and resting areas. The project sponsor will minimize the use of rock in its design in order to keep construction costs down and staying in line with the 319 Program's preferred natural stream design approach;
- Install one (1) new livestock crossing;
- Establish a 35-foot riparian buffer along both sides of the stream;
- Plant native trees and shrubs to stabilize streambanks and shade the channel;
- Create 0.5 acre emergent wetland along the left floodplain.

➤ Horst Property

- Narrow the bankfull and base flow width along overwide channel sections by installing bankfull benches to improve sediment transport;
- Increase pool to riffle ratio by excavating deep pools and constructing cobble-gravel riffles with boulder grade control;
- Install log and several boulder structures to stabilize streambanks and create in-stream habitat including overhead cover and resting areas. The project sponsor will minimize the use of rock in its design in order to keep construction costs down and staying in line with the 319 Program's preferred natural stream design approach;
- 
- Adjust the location of the existing fencing to establish a 35-foot riparian buffer along both sides of the stream;
- Upgrade and stabilize the two (2) existing livestock crossings;
- Remove invasive plant species and provide long-term maintenance for control.
- Plant native trees and shrubs to stabilize streambanks and shade the channel.

Detailed Scope of Work - Phase 1 - Design and Permitting

➤ Topographic Survey and Base Map Preparation

- Set up a GPS ground control network.
- Field run topography will be utilized to develop design base maps along the Bachman Run stream corridor (approximately 2,800 linear feet).
- A field-run topographic survey will be conducted to provide detailed channel topography. This will include:

Bachman Run Mainstem

- Extend 100 feet from top of bank along the right and left floodplain,
- Survey a longitudinal profile along the project reaches. The profile survey will follow the thalweg and include channel bed, water surface, and top of bank profiles at key points (e.g., top and bottom of riffles, bottom of run, Dmax of pools, and top of glide, etc.);
- A baseline will be established along the right floodplain for the entire length of the project reach.
- Cross-sections will be established off the base-line, extending 50 feet from top of bank along the right and left floodplain and include key points along the channel (Apex of bends, mid-riffle, max depth of pools). Significant in channel features (e.g. bedrock outcrops) will be identified.
- Identification and survey of any public or private utilities, such as, Route 322 culvert, Bender Lane and bridge, storm drain outfalls along Route 322, phone and power poles, etc.

- At Route 322, survey upstream, downstream and through the stream sections at the culvert with sufficient detail to allow hydraulic analysis of these structures.
- Vertical and horizontal controls will be set.

#### Unnamed Tributary

- Extend 25 feet from top of bank on either side of the channel;
  - Survey a longitudinal profile along the tributary. The profile survey will follow the thalweg and include channel bed, water surface, and top of bank profiles at key points;
  - Vertical and horizontal controls will be set.
- Develop the following base maps of the project area from the field run survey for use in developing restoration designs.
    - The plan view will be prepared at 1 in. = 20 ft. Cross-sections will be prepared at 1 in. = 5 ft. vertical and 1 in. = 5 ft. horizontal. Longitudinal Profile will be prepared at 1 in. = 5 ft. vertical and 1 in. = 20 ft. horizontal.
    - The plan view will include topography at one-foot contour intervals in the channel and across the floodplain/terraces and adjacent hill slopes to either side of the channel;
    - It will show existing structures, such as roads, culvert and bridge;
    - Major stream features (e.g., point bars, depositional areas, rock outcrops, etc.) will be shown.
- Hydrologic and Hydraulic Analysis
- Utilizing standard hydrologic modeling methods (TR-20) develop the peak discharge rate for the 1-, 2-, 10-, 50- and 100-year 24-hour storms under existing conditions for the project reach. The model will be calibrated to regional regressions and/or the FEMA 100-year published flow data so as to serve as the basis for analyzing in the following flood plain modeling effort.
  - Utilizing the 1-, 2-, 10-, 50 and 100-year flows developed from the hydrologic analysis and regional regressions, conduct existing and proposed hydraulic analyses for the project reaches. Traditional methods including HEC-RAS will be used to approximate and model existing and proposed water surfaces and hydraulic parameters associated with these flow events.
  - This scope of work assumes that the proposed project will result in less than 0.01-foot flood water surface elevation change and remain consistent with PADEP regulations. If however this cannot be achieved, it will become necessary to proceed through the process to obtain a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) process with FEMA. The SOW effort and costs will have to modify to complete these tasks.
- Stream Assessment and Design Criteria
- Conduct Rosgen Level II Morphological Survey and Level III Stream Condition Assessment
  - Collect and analyze bulk sediment samples to verify sediment transport competence
  - Determine design bankfull channel dimensions.
- Preliminary Design Plans
- Utilizing the field-run topography and base maps, prepare preliminary design plans. The plans will include: plan view sheets, representative cross-section sheets, structure typical details, and preliminary landscape plans for the Bachman Run stream corridor.
- Final Design Plans and Construction Documents
- Prepare final restoration design plans. The plans package will include: grading plans, cross-section sheets, profile sheets, and grading typical details, and final landscape plans for the Bachman Run stream corridor.
  - Prepare a Design Report that summarizes the results of the field studies, existing/proposed conditions hydrologic and hydraulic analysis, sediment transport analysis, and supporting engineering computations for the restoration/stabilization of Bachman Run project reaches.

- Prepare Erosion and Sediment Control Plans including sequence of construction; stockpile and staging areas, clean water diversion, sediment and erosion control measures,
  - Prepare Construction Documents including construction specifications; materials (wood, boulder, cobble and gravel and plant materials) quantities; and structure tables, earthwork (cut & Fill) quantities; geometry coordinates (plans, line & curve tables and cross-section stakeout points). The project sponsor will minimize the use of rock in its design in order to keep construction costs down and staying in line with the 319 Program's preferred natural stream design approach;
  - Prepare final engineer's cost estimates for materials and construction.
  - A Professional Engineer licensed in the state of Pennsylvania will review, sign and seal the final design plans.
- Local, State, and Federal Permit Applications
- Conduct environmental assessments required for permitting including wetland delineation, archeological, historical, RET, etc.
  - Conduct a pre-application field meeting with the local, state and federal permitting agencies to present the preliminary design plans, discuss overall project goals and objectives and site-specific constraints.
  - Prepare Erosion and Sediment Control Submittal Package.
  - Prepare Joint Permit Application packages for submission to the Quittapahilla Watershed Association. The authorized representative for the DFTU will sign and forward the permit application package to the permitting agencies.
  - Prepare written responses (with accompanying plan revisions) to agency comments and or questions.
- Bid Assistance
- After the design plans are completed but prior to permits being issued Clear Creeks will prepare Bid Documents and conduct a Site Showing for perspective contractors. DFTU will solicit bid proposals from a list of qualified construction contractors.
  - The Construction Contractor selected for the Project will assist Clear Creeks, DFTU and QWA in preparing grant applications for funding of the Construction Phase of the Project.
- OM&R Plan
- Clear Creeks will prepare a Preliminary OM&R Plan for the Project Area that defines allowed and prohibited activities along the project area. Identify monitoring, maintenance and repair activities to be performed, outline a schedule for those activities and the parties responsible for conducting those activities.
- Project Management, Coordination, Meetings and Site Visits
- Clear Creeks has:
    - Assisted DFTU in obtaining funding including:
      - Attended Landowner Meetings,
      - Conducted Rapid Geomorphic Assessment,
      - Prepared 319 Work Plan, Detailed Project Narrative Description, Exhibits, Scope of Work, etc.
      - Prepared Restoration Concept Plans.
  - Clear Creeks will:
    - Manage project scheduling, prepare and submit invoices for payment, prepare status reports for Doc Fritchey Trout Unlimited and prepare final project report.
    - Conduct Intra-Team office/field meetings to discuss hydrologic and hydraulic analysis, the findings of the field studies and subsequent recommendations, drafting of preliminary and final design drawings, and other project related issues.

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- Attend up to three (3) office/field meetings with DFTU and QWA and property owners to discuss project scheduling, the findings of the field studies and subsequent recommendations, discuss landscaping issues, present preliminary and final design drawings, and other project related issues.

#### **D. Monitoring**

Not applicable to this project.

#### **E. QAPPs**

A QAPP will be developed for those activities and submitted to EPA for review and approval prior to any data collection/generation.

#### **F. On-Site BMPs/BMP Efficacy**

The Bachman Run – Bachman and Horst Properties Stream Restoration Project will restore 2,781 linear feet of in-stream and riparian habitat along the mainstem Bachman Run. This will reduce nitrogen, phosphorus and sediment loadings to Bachman Run from streambank erosion by 208.6 lbs./yr., 189.1 lbs./yr. and 124,811.3 lbs./yr., respectively. In addition, the project will convert heavily impacted pasture into 0.5 acres of emergent wetlands in the adjacent floodplain. The Final Project Report will include load reductions based on the final project design and estimated using the field data collected and Rosgen's BANCS Model to estimate annual streambank erosion rates.(2001), In addition, Model My Watershed will be used to estimate load reductions. This model can be fined tuned utilizing the field data (Dr. Barry Evans, personal communication). Since Model My Watershed is an updated version of the original model used in the Quittapahilla Creek watershed assessment as detailed in the Watershed Implementation Plan, they will be consistent.

#### **G. Sub-grantees**

The Consulting Team of Clear Creeks Consulting and Environmental Planning and Restoration (EPR) will prepare the restoration design plans and obtain local, state and federal permits for this project. The following scope of work outlines the services they will provide under the grant funds we are requesting.

- Develop QAPPs for Topographic Survey and the Hydrologic and Hydraulic Analysis
- Topographic Survey and Base Maps
- Hydrologic and Hydraulic Analysis
- Stream Assessment and Design Criteria
- Preliminary Design Plans
- Final Design Plans and Construction Documents
- Local, State, and Federal Permit Applications
- OM&R Plan
- Construction Bid Assistance

#### **H. Education/Outreach**

Not applicable to this project.

#### **I. Urban/MS4 Activities**

We understand that EPA's Section 319 grants cannot fund any projects or activities that are part of the National Pollutant Discharge Elimination System (NPDES) program, such as Municipal Separate Storm Sewer Systems (MS4s). We hereby confirm that this project is not part of the NPDES program nor intended to address MS4 requirements.

**J. O&M Plan**

Doc Fritchey Trout Unlimited (DFTU) and Quittapahilla Watershed Association (QWA) will provide volunteers for installation of plant materials and post-construction monitoring and maintenance. A formal OM&R Plan will be included in the Project's Final Report.

**K. Competitive Bid**

The Doc Fritchey Chapter of Trout Unlimited (DFTU) and our partners, Quittapahilla Watershed Association (QWA) and Lebanon Valley Conservancy (LVC) developed evaluation criteria (i.e., past performance, specialized experience, technical competence and familiarity with the Quittapahilla watershed) for engineering consultants and construction contractors that perform work related to stream, floodplain and wetland restoration.. Utilizing the criteria we evaluated area firms in each category and developed a list of pre-qualified consultants and construction contractors.

Drawing from our list of pre-qualified consultants, the consulting team of Clear Creeks Consulting and Environmental Planning and Restoration (EPR) was determined to be the most qualified to prepare the restoration design plans and to obtain local, state and federal permits for the Bachman Run Project. They were able to meet the anticipated design and permitting contract amount for the project.

After the design plans are completed, but prior to permits being issued Clear Creeks will prepare construction bid documents. DFTU and QWA will solicit bid proposals from our list of pre-qualified construction contractors. Clear Creeks and DFTU will conduct a Site Showing for interested contractors. The most qualified construction contractor able to meet the anticipated construction contract amount will be selected. The selected contractor will assist Clear Creeks, DFTU and QWA in preparing grant applications for funding of the Construction Phase of the Project.

Doc Fritchey Trout Unlimited has abided by/will abide by Pennsylvania's procurement regulations.

**L. Contingency Plan (AMD only)**

Not applicable to this project.

**M. Project Deliverables**

- QAPP for Topographic Survey and Hydrologic & Hydraulic Analysis
- Final Design Plans and Construction Documents
- Local, State and Federal Permit Application Package
- OM&R Plan
- Bid Assistance
- Landowner Grantee Agreement
- Final Project Report

All deliverables will be uploaded to GRTS upon project completion

**N. Project Schedule/Timeline**

Project Start Date: April 1, 2022      Project End Date: June 30, 2023

<b>Task</b>	<b>Start and Completion Dates</b>
Phase 1 – Design and Permitting	
Develop QAPP and submit to EPA for review and approval	NTP – Day 45
Topographic Survey and Base Maps	NTP – Day 165
Hydrologic and Hydraulic Analysis	NTP – Day 165
Stream Assessment and Design Criteria	NTP – Day 165
Preliminary Design	Day 165 – Day 225
Final Design and Construction Documents	Day 225 – Day 260
Local, State and Federal Permitting	Day 260 – Day 440

**O. Measures of Success - (environmental indicators)**

The Bachman Run – Bachman and Horst Properties Stream Restoration Project will restore 2,781 linear feet of in-stream and riparian habitat along the mainstem Bachman Run. This will reduce nitrogen, phosphorus and sediment loadings to Bachman Run from streambank erosion by 208.6 lbs./yr., 189.1 lbs./yr. and 124,811.3 lbs./yr., respectively. In addition, the project will convert heavily impacted pasture into 0.5 acres of emergent wetlands in the adjacent floodplain.

**P. Partner Contributions**

For this project, the Doc Fritchey Trout Unlimited will provide administrative and contract management services. DFTU will also coordinate with the landowners to obtain the necessary Access Authorizations, Letters of Commitment and Landowner Grantee Agreements. Clear Creeks Consulting and EPR are providing numerous hours of in-kind services as match. The value of the matches is included below.

Initial contact made by a representative of DFTU indicated that the landowner is interested in participating. The Bachman and Horst Families are donating approximately 7.0 acres of their pastureland along the floodplain to be converted into wetlands and riparian buffer to support the project. The value of that land will be utilized as a match for the construction funding grant.

All final partnership contributions or match will be captured in the Final Project Report attached in GRTS upon project completion.

**Q. Mandatory Attachments**

**Task 1: Final Design and Construction Documents**

Item	Task		Responsible Partner	Grant Request	Match (Partner Contribution)	Total
<b>Administration</b>	Grant and Contract Management		DFTU	\$6,294.00	\$287.00	\$6,581.00
	Landowner Coordination, Letters of Commitment and Agreement		DFTU		\$3,000.00	\$3,000.00
<b>Contractual</b>	Design		Clear Creeks	\$42,600.00		\$42,600.00
			EPR	\$83,291.00		\$83,291.00
	Project Mgmt. & Coordination		Clear Creeks		\$7,000.00	\$7,000.00
	Project Admin. & Coordination		EPR		\$5,000.00	\$5,000.00
	QAPP		Clear Creeks		\$6,100.00	\$6,100.00
<b>Subtotal</b>				\$132,185.00	\$21,387.00	\$153,572.00

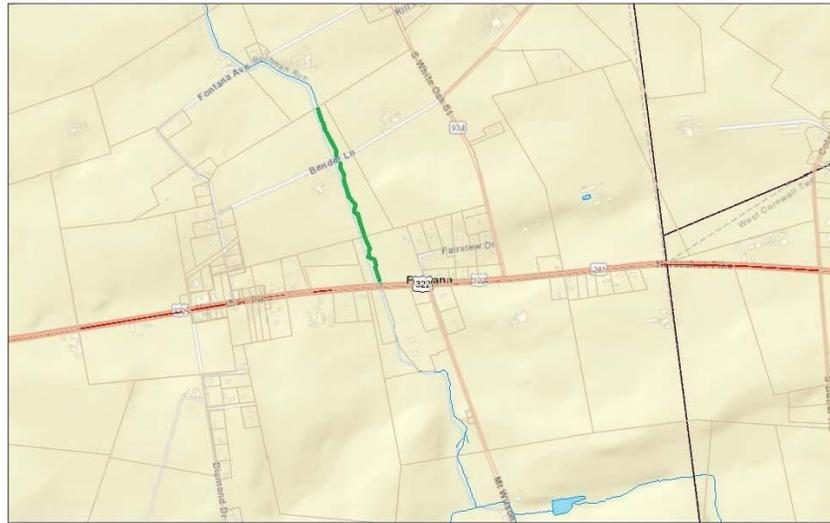
**Task 2: Local State and Federal Permit Package, Bid Assistance, and OM&R Plan**

Item	Task	Responsible Partner	Grant Request	Match (Partner Contribution)	Total
<b>Administration</b>	Grant and Contract Management	DFTU	\$1,376.00		\$1,376.00
<b>Contractual</b>	Permitting	Clear Creeks	\$10,000.00		\$10,000.00
		EPR	\$7,020.00		\$7,020.00
	Bid Assistance	Clear Creeks	\$7,000.00		\$7,000.00
	OM&R Plan	Clear Creeks	\$3,500.00		\$3,500.00
<b>Subtotal</b>			\$28,896.00		\$28,896.00
<b>Total</b>			\$161,081.00		\$182,468.00

**R. Maps and Photos**

**1. Location Map**

March 15, 2021



LOCATION MAP BACHMAN RUN - BACHMAN AND HORST PROPERTIES STREAM RESTORATION PROJECT 0 0.1 0.2 0.4 mi



DATE: OCTOBER 2020

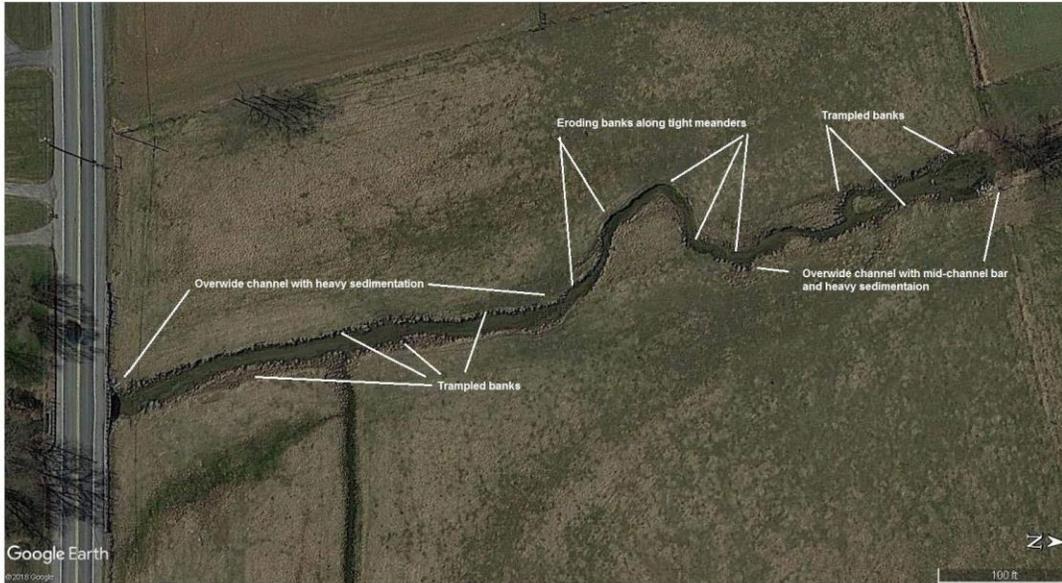
## 2. Site Map(s)



SITE MAP BACHMAN RUN - BACHMAN AND HORST PROPERTIES STREAM RESTORATION PROJECT 1:9,028 0 0.05 0.1 0.2 mi



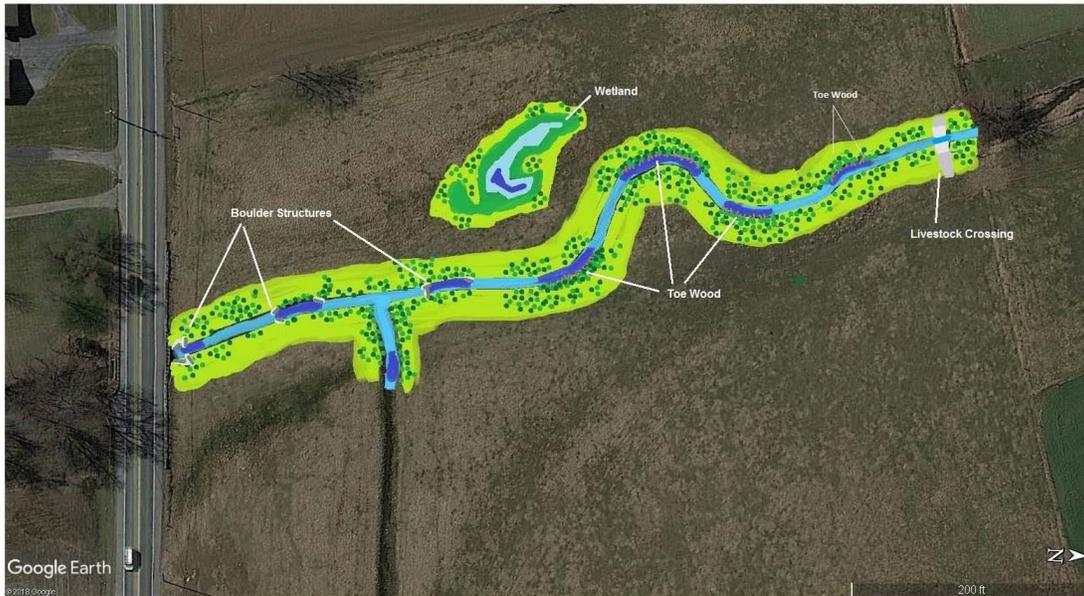
DATE: OCTOBER 2020



Existing Conditions – Bachman Property



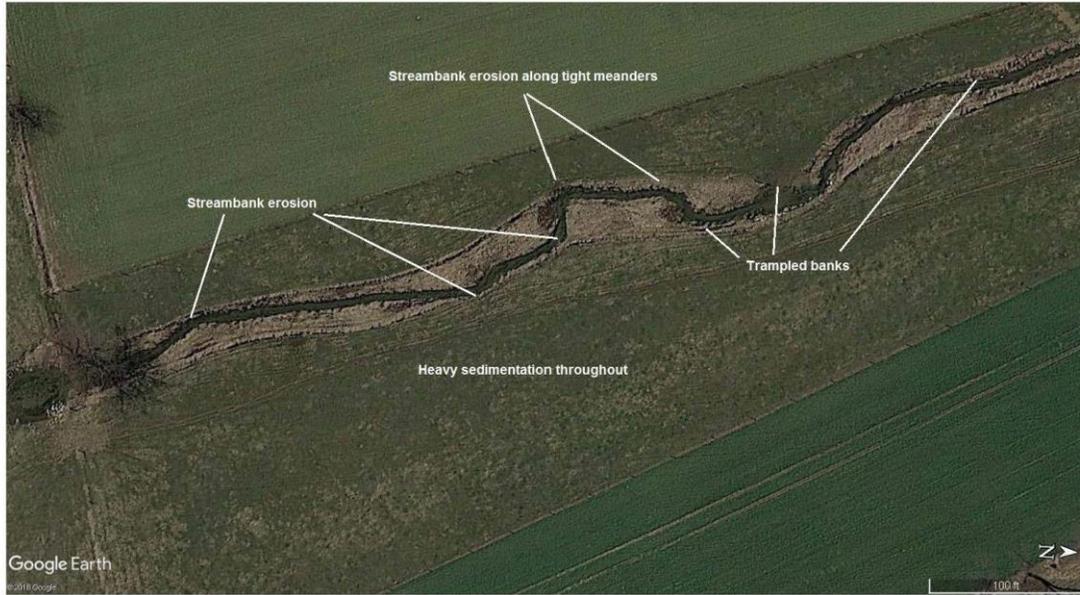
DATE: OCTOBER 2020



Restoration Concept – Bachman Property



DATE: OCTOBER 2020



Existing Conditions – Horst Property Upper Reach



DATE: OCTOBER 2020



Restoration Concept – Horst Property Upper Reach



DATE: OCTOBER 2020

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Existing Conditions –Horst Property Middle Reach



DATE: OCTOBER 2020



Restoration Concept – Horst Property Middle Reach



DATE: OCTOBER 2020

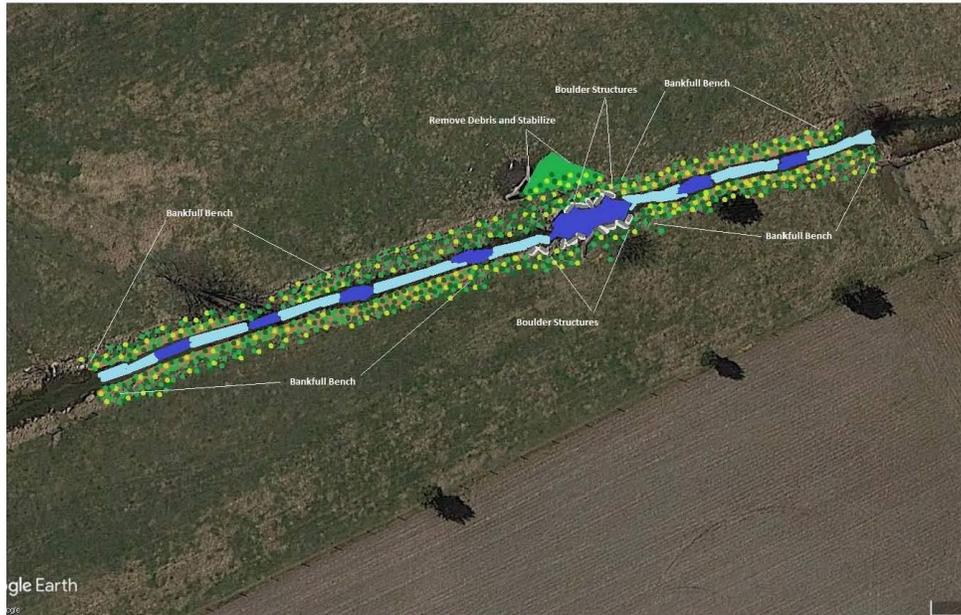
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Existing Conditions – Horst Property Lower Reach



DATE: OCTOBER 2020



Restoration Concept – Horst Property Lower Reach



DATE: OCTOBER 2020

3. Existing Conditions Photos



March 15, 2021



March 15, 2021



March 15, 2021



March 15, 2021

**S. Landowners**

Geraldine Bachman  
783 Horseshoe Pike  
Lebanon, PA 17042

Lillian Horst  
870 Bender Lane  
Lebanon, PA 17042

Both Landowners have signed Access Authorization and Letters of Commitment on file with DEP.