Hammer Creek ARP First Triennial Report

Bureau of Clean Water
May 27 and 28, 2025

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INTRODUCTION

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What is an ARP

Advance Restoration Plan

- Like a TMDL + Watershed Implementation Plan
- Generates funding for voluntary BMP Implementation
- Effective for nonpoint sources
- Reserved for special cases

Some ARP Elements

- Prescribes numeric pollution reduction goal
- Determines BMP opportunities
- Determines how to credit BMPs
- Selects BMPs based on site needs, feasibility and economics
- Establishes schedule
- Describes stakeholder roles
- Education and outreach
- Monitoring and assessment
- Tracking and reporting
- Adaptive Management

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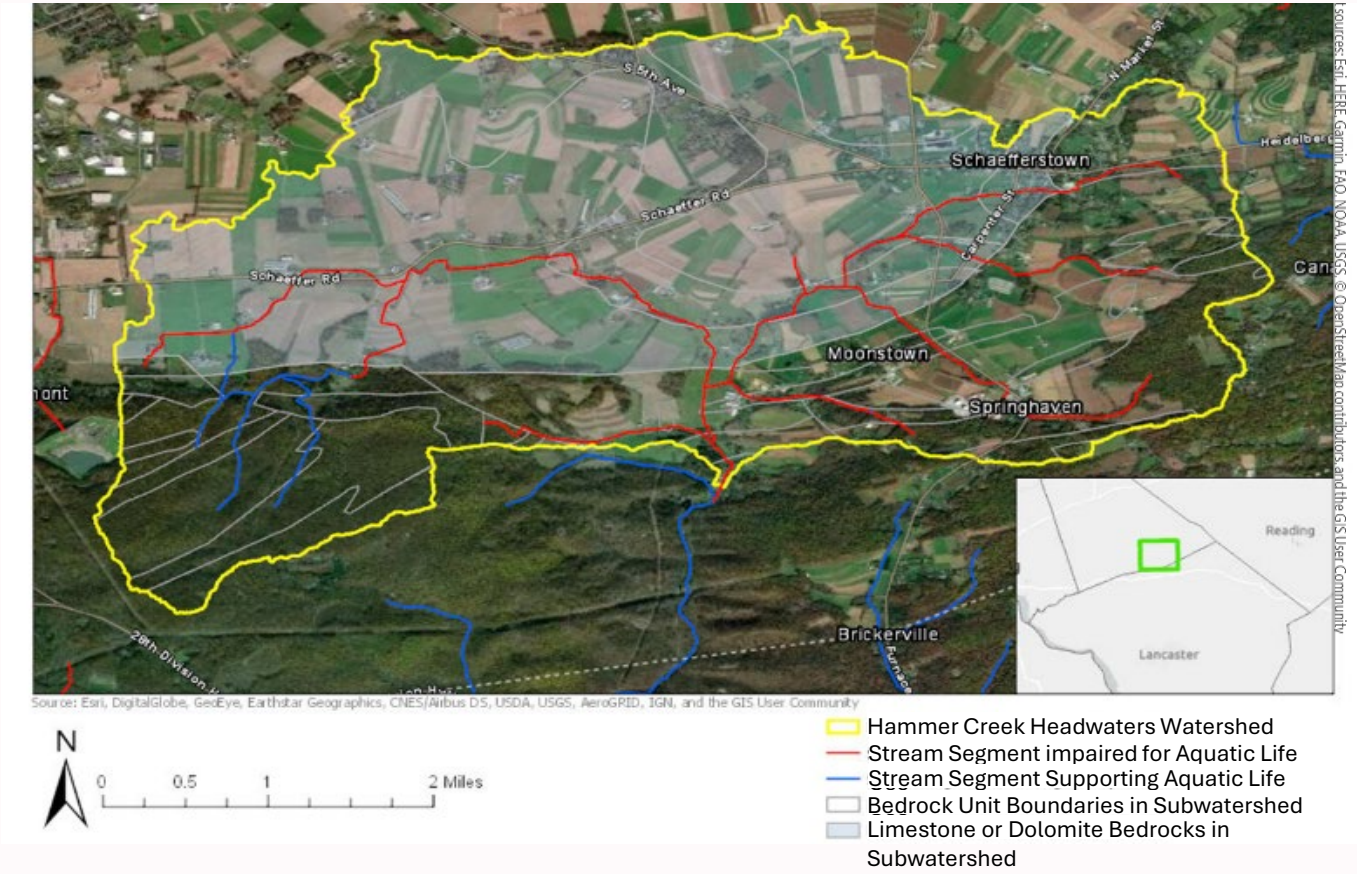
Hammer Creek Headwaters



Geology information were derived from the pagpoly GIS layer provided by Pennsylvania Bureau of Topographic and Geological Survey, Dept. of Conservation and Natural Resources. Watershed delineated in part using TauDEM tools in ArcGIS Pro.

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Trout Potential

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Speedwell Forge Lake

Photo by Bradford T. Clubb, Flyway Excavating, Inc.

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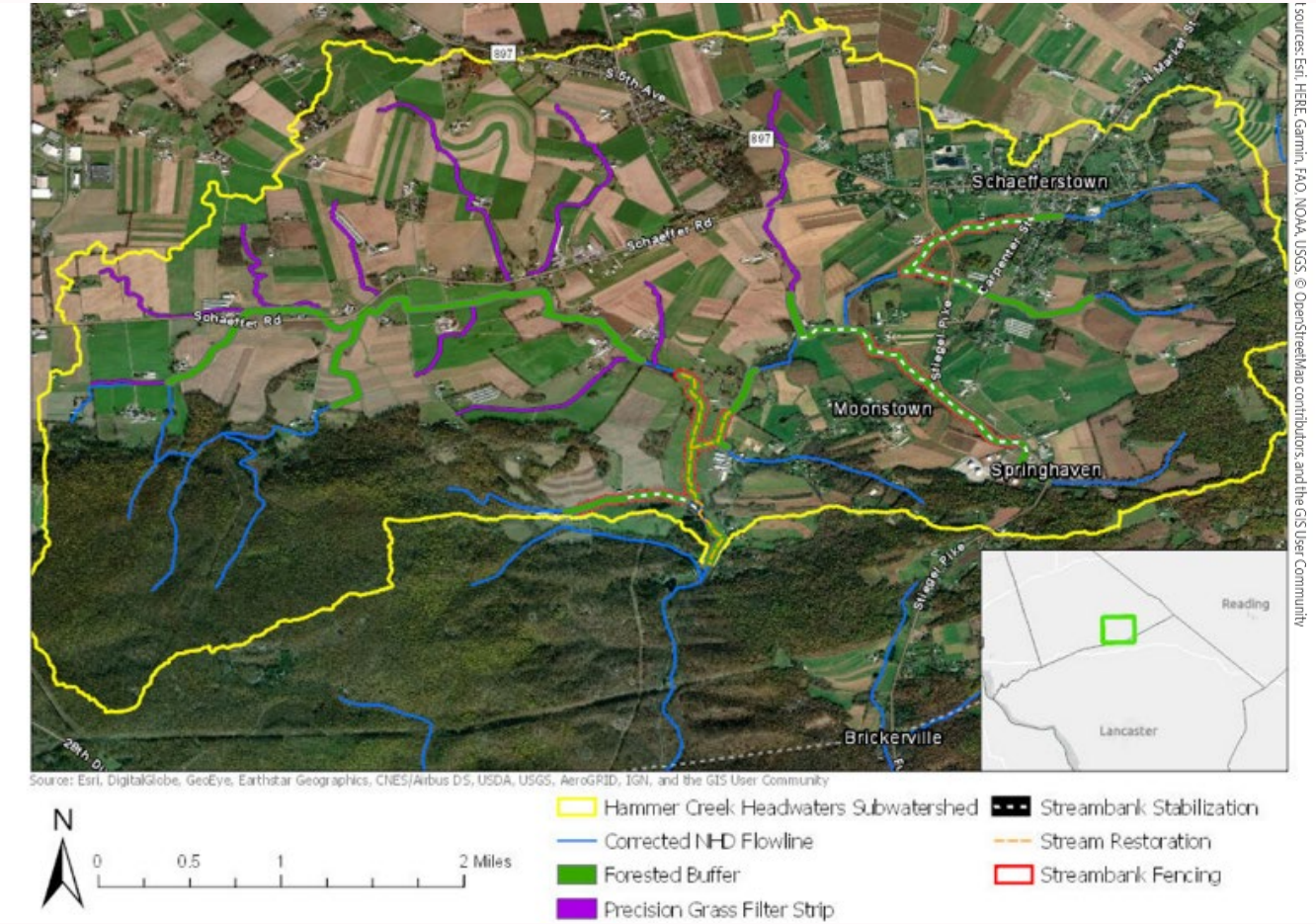
Best Management Practices



BMPs

- Riparian Buffers
- Precision Grass Filter Strips
- Streambank Stabilization/Restoration
- Stream Fencing
- E&S Plans
- Conservation Tillage
- Grazing Land Management

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Precision Grass Filters

How does pollution get from the landscape to the stream?

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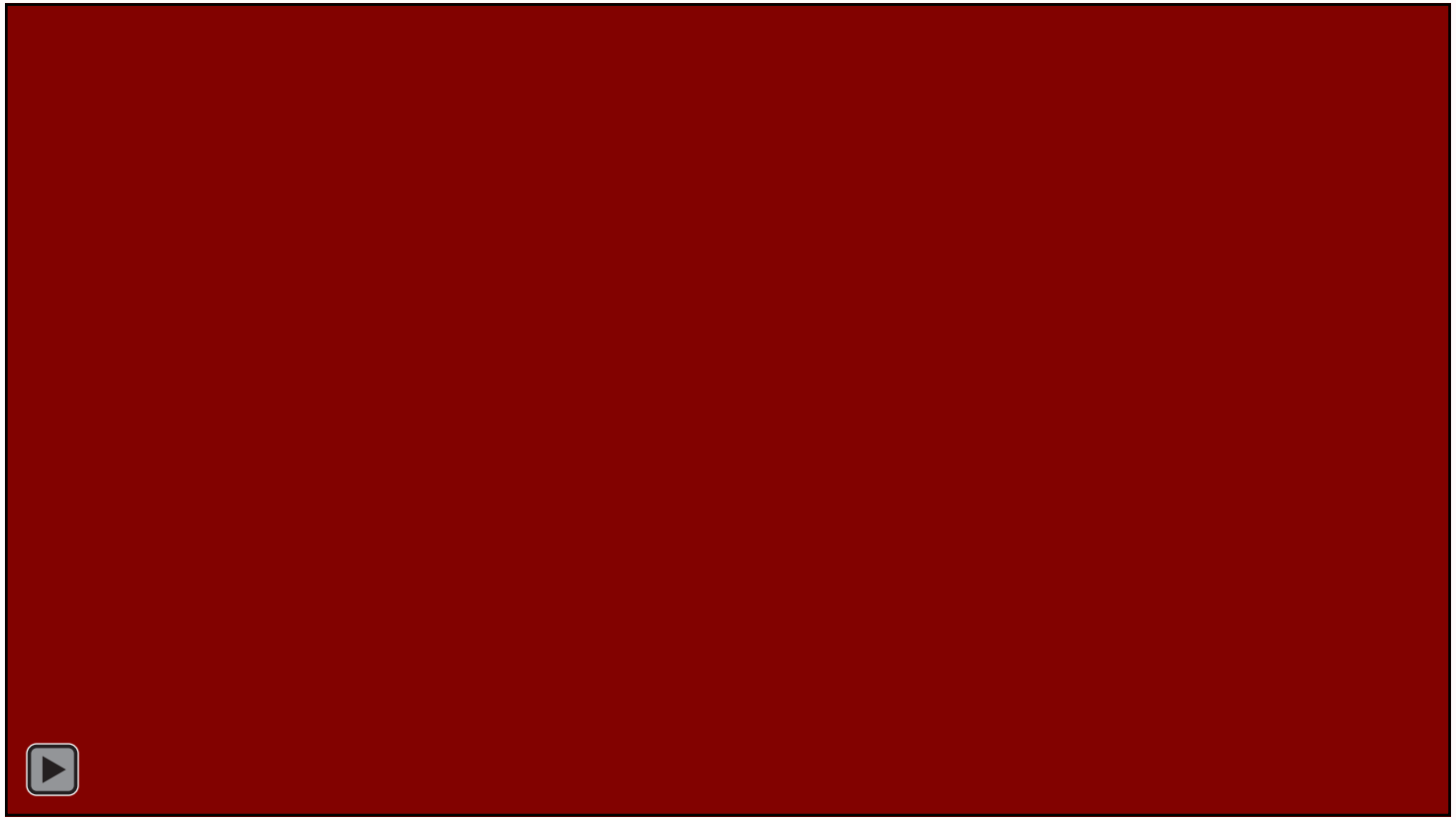
Precision Grass Filters



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FIRST TRIENNIAL PROGRESS

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First Triennial Progress

Tasks

- Monitoring and Assessment
- Partnership building
- Landowner Outreach
- Fundraising
- BMP Implementation

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Monitoring Efforts

- Habitat screening
- Sediment deposition in pools and riffles
- Continuous instream monitoring
    - Turbidity
    - Flow
    - Temperature
- Benthic macroinvertebrates
- Fish

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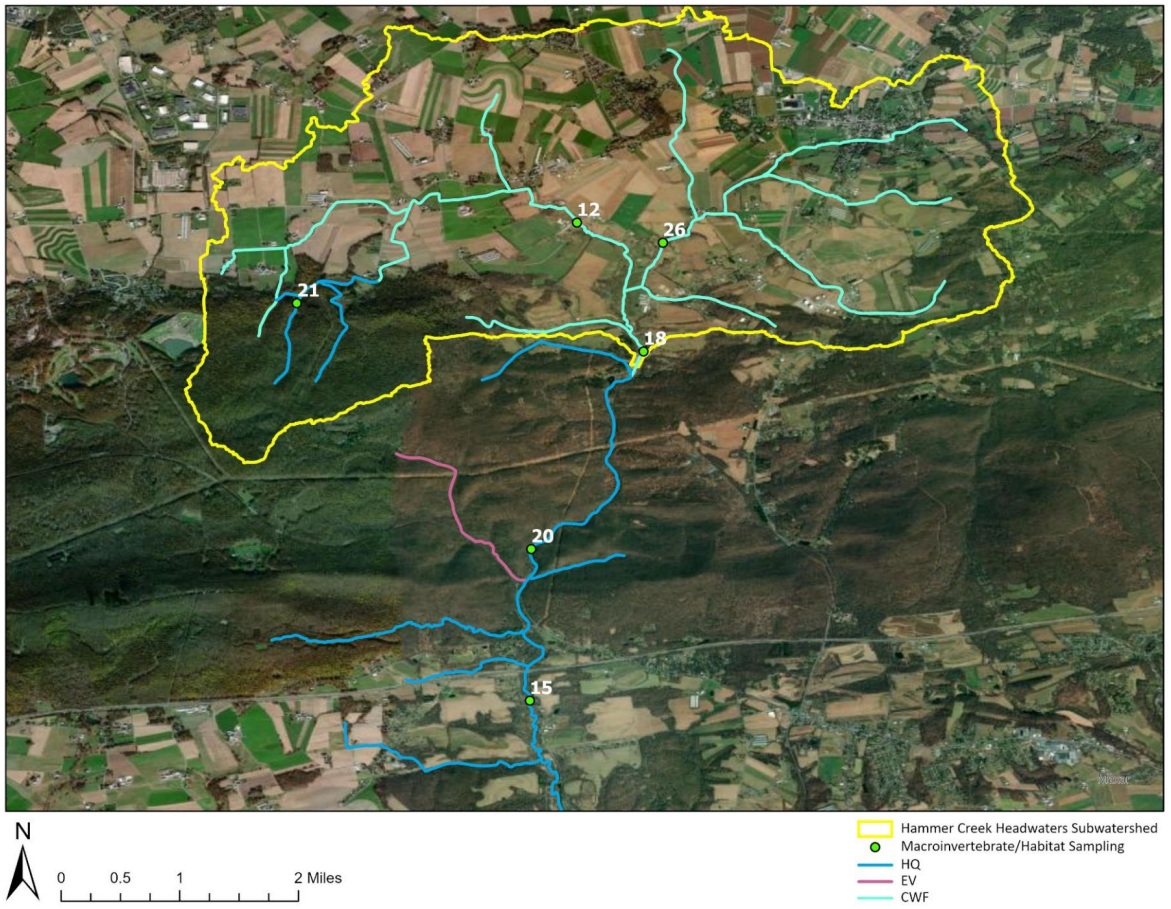
Monitoring: Habitat Screening



Sediment Deposition Plus Embeddedness:

- Threshold: 24

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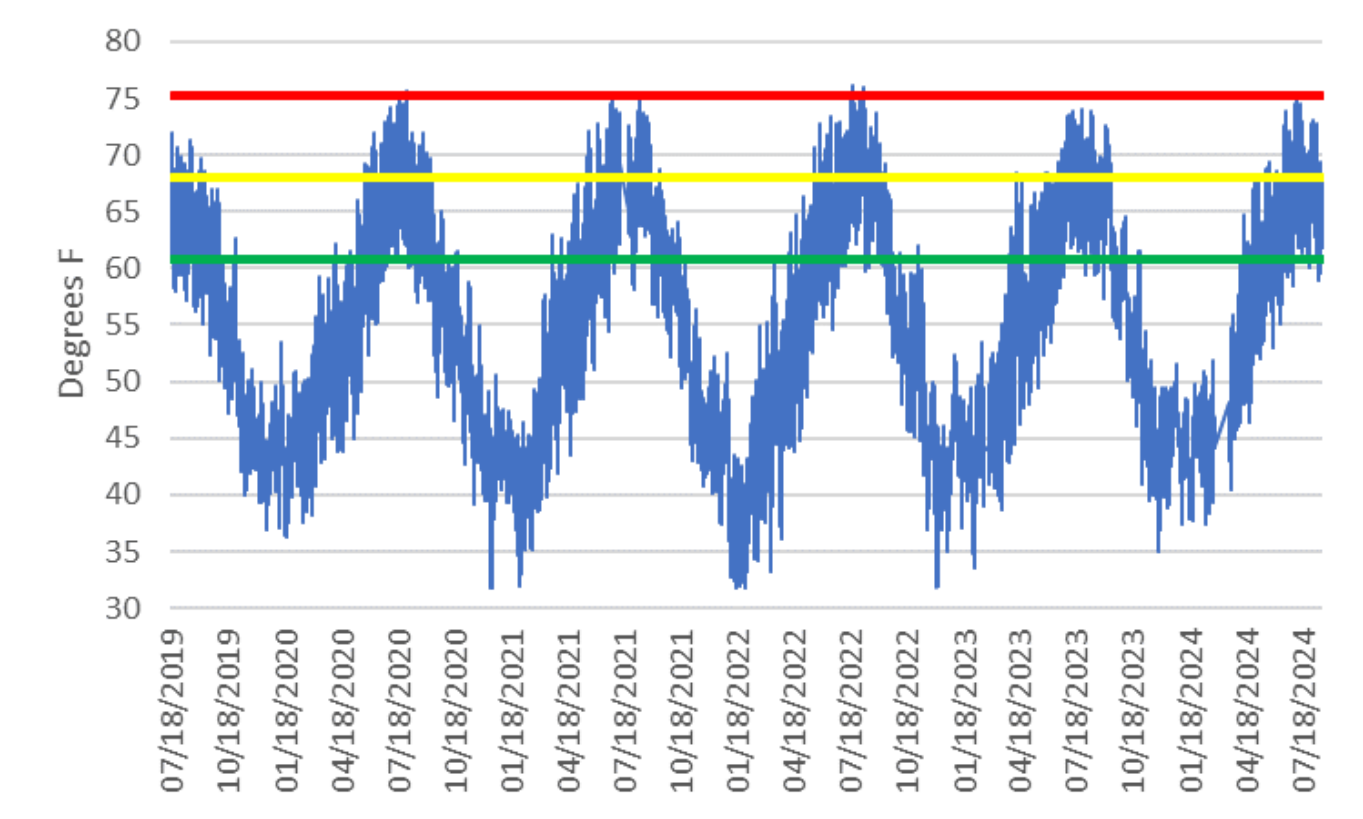
Continuous Instream Monitoring



- Temperature data from SRBC gage
- USGS gage to monitor sediment loads

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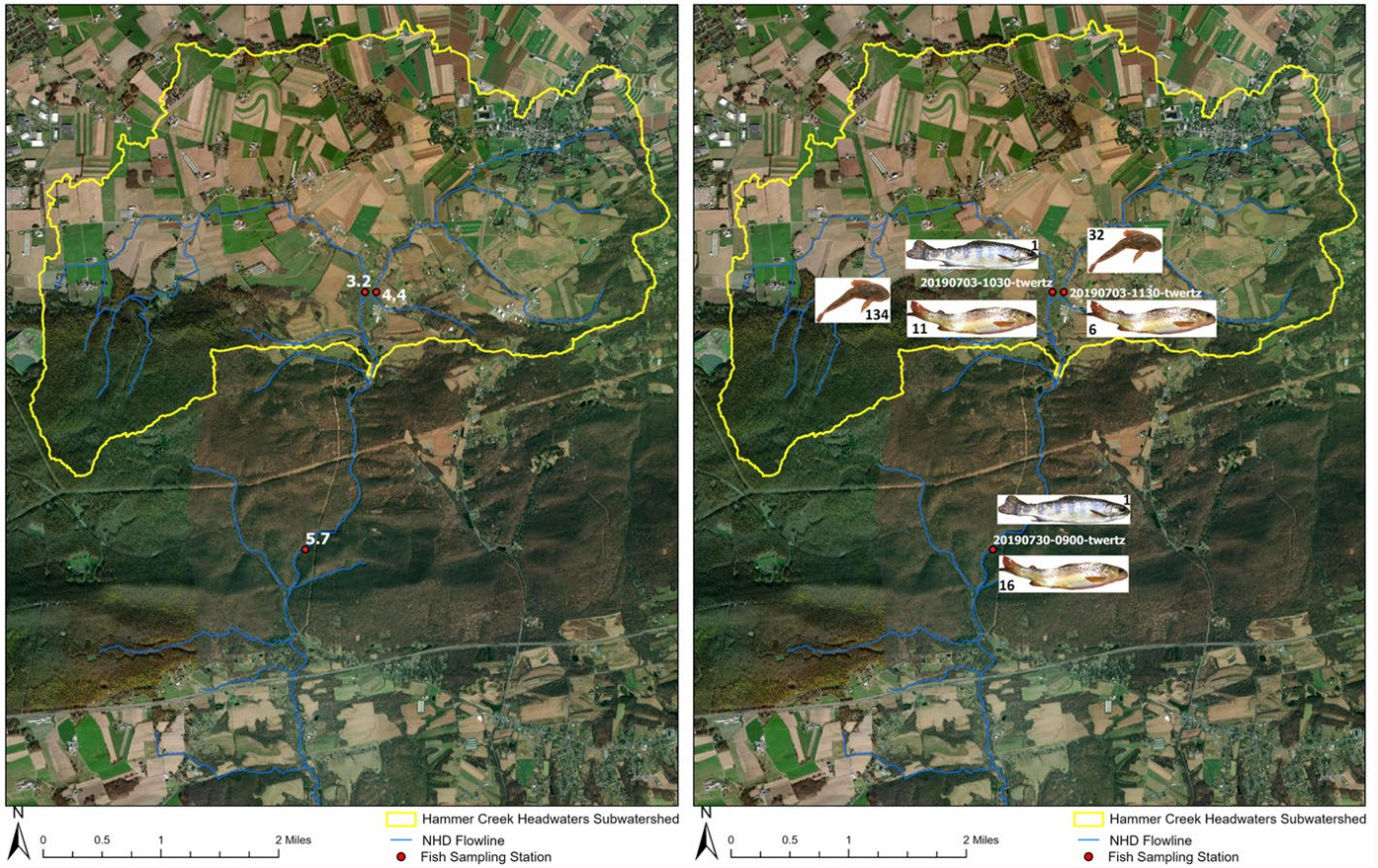
Monitoring: Fish

TFI > 5.7 = impaired



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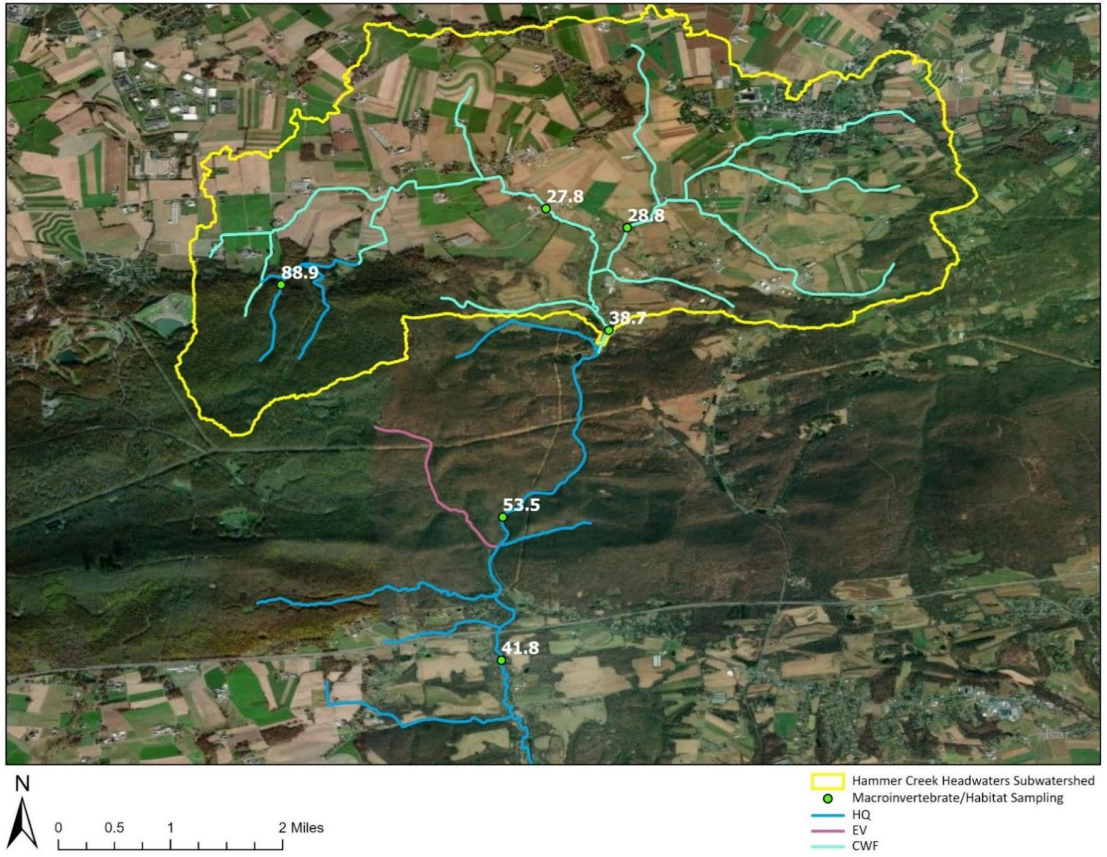
Monitoring: Benthic Macroinvertebrates



IBI Score Thresholds:

- 43 for Cold Water Fishes
- 63 for High Quality

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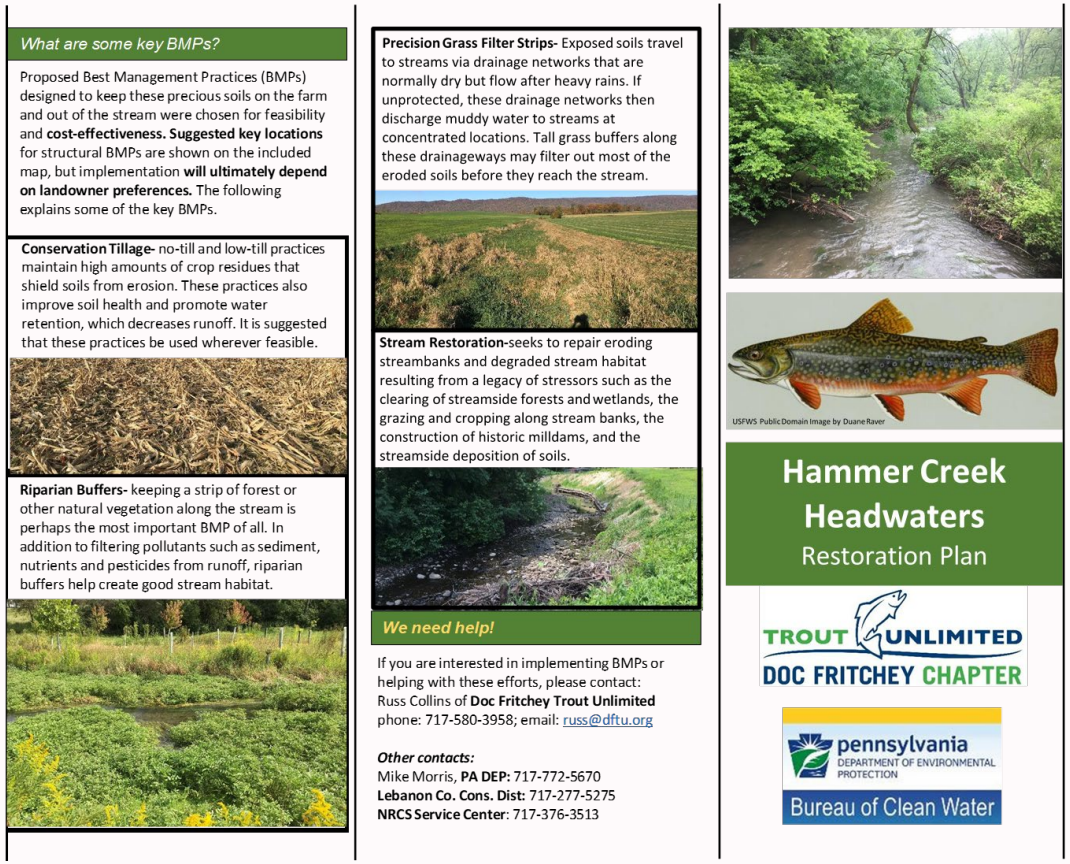
Landowner Outreach

Tasks

- Door to door visits
- Public mailing
- Public meeting, June 6, 2022
- Trifold pamphlet
- LancasterOnline newspaper article



What are some key BMPs?

Proposed Best Management Practices (BMPs) designed to keep these precious soils on the farm and out of the stream were chosen for feasibility and **cost-effectiveness. Suggested key locations** for structural BMPs are shown on the included map, but implementation **will ultimately depend on landowner preferences.** The following explains some of the key BMPs.

Conservation Tillage- no-till and low-till practices maintain high amounts of crop residues that shield soils from erosion. These practices also improve soil health and promote water retention, which decreases runoff. It is suggested that these practices be used wherever feasible.

Riparian Buffers- keeping a strip of forest or other natural vegetation along the stream is perhaps the most important BMP of all. In addition to filtering pollutants such as sediment, nutrients and pesticides from runoff, riparian buffers help create good stream habitat.

Precision Grass Filter Strips- Exposed soils travel to streams via drainage networks that are normally dry but flow after heavy rains. If unprotected, these drainage networks then discharge muddy water to streams at concentrated locations. Tall grass buffers along these drainageways may filter out most of the eroded soils before they reach the stream.

Stream Restoration-seeks to repair eroding streambanks and degraded stream habitat resulting from a legacy of stressors such as the clearing of streamside forests and wetlands, the grazing and cropping along stream banks, the construction of historic milldams, and the streamside deposition of soils.

We need help!

If you are interested in implementing BMPs or helping with these efforts, please contact:
Russ Collins of **Doc Fritchey Trout Unlimited**
phone: 717-580-3958; email: russ@dftu.org

Other contacts:
Mike Morris, **PA DEP:** 717-772-5670
Lebanon Co. Cons. Dist: 717-277-5275
NRCS Service Center: 717-376-3513

USFWS Public Domain Image by Duane Raver

Hammer Creek Headwaters
Restoration Plan

TROUT UNLIMITED
DOC FRITCHEY CHAPTER

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Project Organization

Original Partnership

- Doc Fritchey Chapter of Trout Unlimited
- PA DEP

New Partnership

- Doc Fritchey Chapter of Trout Unlimited
- PA DEP
- The Nature Conservancy
- Lebanon County Conservation District
- Consultants

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Fundraising

>$2.5 million raised:

- 319
- CAP
- SRBC
- NFWF
- Trout Unlimited
- Keystone Protein Settlement

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Recent BMP Implementation

BMP	Unit of Measure	Reductions since 2021[1] (lb/yr)
Agricultural Erosion & Sedimentation Plan Implementation[2]	0 acres	0
Grass Waterway[3]	3.8 acres	9,454
Prescribed Grazing[4]	47.5 acres	2,481
Heavy Use Area protection[5]	0.3 acres	6
BMP A[6]	Not Specified	1,609
Cover Crop[7]	111 acres	31,802
Conservation Tillage[8]	See Table 2	-1,143,044
Stream Restoration[9]	1,040 feet	28,496
	Total	**-1,069,196**
First Triennial Reduction Goal		2,645,138
Total Reduction Goal		4,056,504
Percent of total goal		-26%

Lack of reductions so far:

- Landowner negotiations
- Design and permitting
- Fundraising
- Declining conservation tillage

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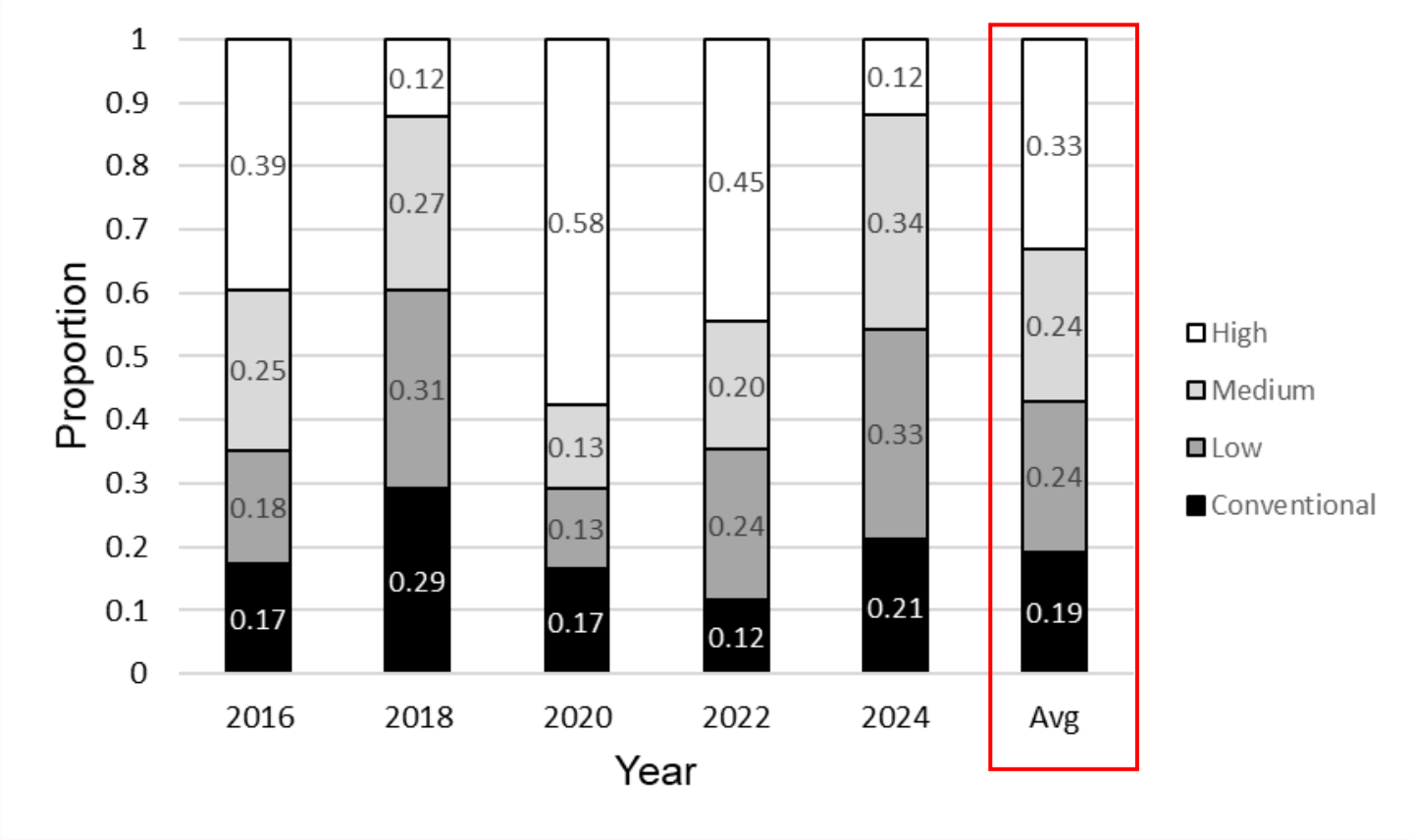
Declining Conservation Tillage



Capital RC&D Transect Surveys

- Chesapeake Bay Watersheds
- 750 sample locations in Lebanon Co
- 150-200 in SE Lebanon Co. analyzed

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Declining Conservation Tillage

	Avg 2016-2024			2024		
	%	acres	lbs/yr	%	acres	lbs/yr
Conventional Till	19	692	1,982,743	21	765	2,192,739
Low Residue	24	854	2,006,735	33	1,193	2,802,836
Medium Residue	24	862	1,457,077	34	1,216	2,054,725
High Residue	33	1,194	718,025	12	428	257,324
		3,602	**6,164,580**		3,602	**7,307,624**

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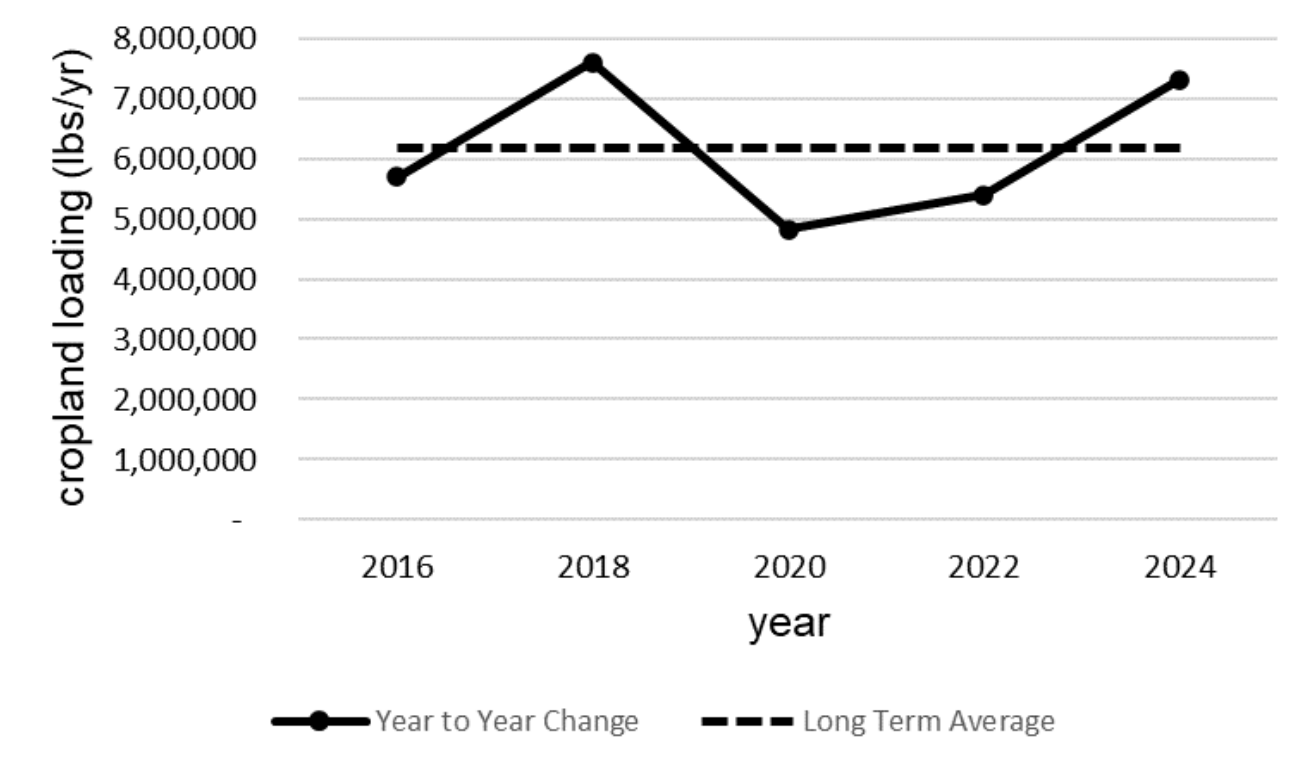
Declining Conservation Tillage



Conclusions:

- Fluctuations in residue levels are expected to drive sediment loading
- Declining residue levels since the start of the project may result in a large increases in sediment loading

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Declining Conservation Tillage

Photo by Andrew Bossi; Creative Commons Attribution-Share Alike 2.5 Generic
File:IMG 0408 - Hungary - Mushroom Farm.JPG - Wikimedia Commons

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GOING FORWARD

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Ongoing Efforts

- Demand for stream restoration
  - Several projects being designed
  - Others in waiting
  - Can leverage other BMPs
- Lancaster Farmland Trust visits to ≈50 largest farms
- LCCD cover cropping program
- LCCD can provide E&S plans

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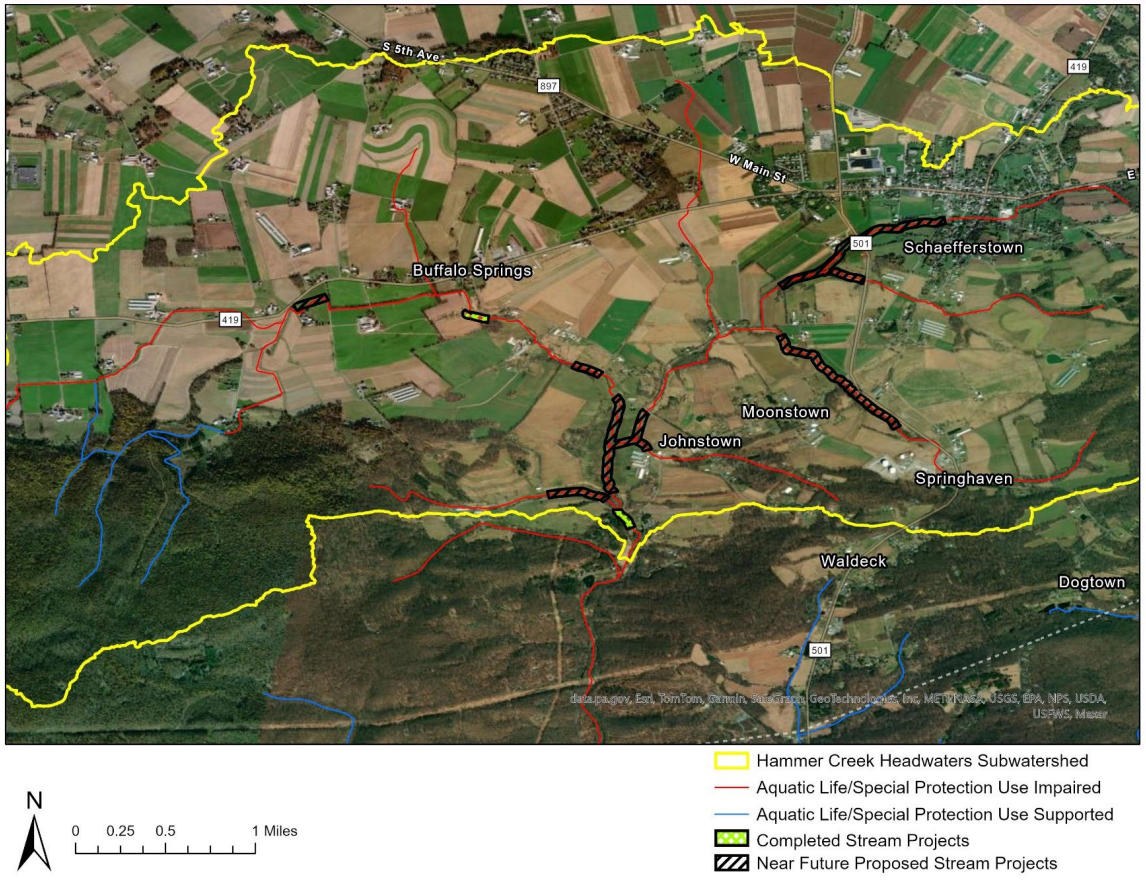
Stream Restoration Projects



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Legacy Sediment Removal

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ARP lessons learned at year 3…

Challenges for Hammer

- Most BMP goals not met
- Time needed for partnership building, fundraising, landowner negotiation, design and permitting periods
- Declining conservation tillage in watershed due to farming trends
- Will there be enough money for legacy sediment removal?

Challenges for ARPs in general

- Partners lose interest when they see draft plans
- Need for professional implementation partners

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References

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DEP. 2021. Hammer Creek headwaters alternate restoration plan. Pennsylvania Department of Environmental Protection, Harrisburg, Pennsylvania. (Available online at: https://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/tmdl/HammerCreekARP.pdf)

DEP. 2024. Hammer Creek advance restoration plan first triennial progress report. Pennsylvania Department of Environmental Protection, Harrisburg, Pennsylvania.

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