

Tioga County Mitigation Advisory Committee

MAC

Mission: Regularly assemble members of various governmental and nongovernmental agencies whose expertise shall contribute to the implementation of both immediate and long-term hazard mitigation strategies for Tioga County, Pennsylvania.

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INTRODUCTION

The following legislative master document is the product of a series of special meetings convened in the summer of 2025 by the Tioga County Mitigation Advisory Committee (MAC), operating under the exclusive authority of the FEMA and PEMA approved Tioga County All-Hazard Mitigation Plan. This Plan has been adopted by the Tioga County Board of Commissioners, all municipalities, stakeholder groups, and formally approved by FEMA and PEMA, ensuring its alignment with both local priorities and federal/state standards.

At the request of Pennsylvania State Representative Clint Owlett, the Committee undertook on-site fieldwork within the Cowanesque Valley region of Tioga County, located in the northwest/northcentral corridor along the Tioga River. This initiative was designed to document the real-world impacts of the August 2024 flooding caused by Tropical Storm Debby and to assess the ongoing challenges related to debris removal, river channel stabilization, and erosion.

The result is this comprehensive legislative document, intended to guide elected officials, stakeholders, and technical partners in understanding the scope of the issues and in charting a path forward. It captures both the immediate storm-related damage and the long-standing systemic challenges of stream and watershed management in the Tioga River Basin.

The document is organized into the following sections:

Section 1: Title Page & Legislative Contacts

A professionally designed cover page featuring appropriate graphics, logos, and branding elements to clearly identify the Tioga County MAC project, its purpose, and its partnership with state and federal stakeholders.

Section 2: Stakeholder and Contact Directory (Pg. 7)

A consolidated directory of contact information for regional stakeholders, including the Tioga County Mitigation Advisory Committee, Tioga County leadership, Pennsylvania Department of Environmental Protection (DEP), other Commonwealth agencies, and federal partners. This section ensures direct lines of communication for follow-up, coordination, and project advancement.

Section 3: Permitting Framework for Stream Access and Mitigation Activities (Pg. 15)

An overview of the regulatory requirements governing stream access, flood mitigation projects, and river channel stabilization work. This section outlines applicable permits, responsible agencies, and procedural steps to ensure compliance with state and federal environmental standards.

Section 4: Funding Resources and Application Guidance (Pg. 20)

A detailed guide to available funding sources, including federal hazard mitigation grants, state-level funding programs, and other relevant resources. Instructions and best practices for navigating application processes are provided to assist stakeholders in securing financial support for future projects.

Section 5: Quick Reference Links (Pg. 27)

An interactive page (to be expanded in future editions) with hyperlinks to agency resources, permitting forms, funding opportunities, and technical guidance documents. This section will evolve into an online resource hub complementing the legislative master document.

Section 6: Legislative Outreach Master Presentation (Pg. 33)

This section is derived from a PowerPoint presentation originally prepared as a general presentation to interested parties and stakeholders, and has been modified accordingly for the benefit of legislative decision-makers. It provides a concise background on the history of stream remediation issues within the Cowanesque Valley, the impacts of Tropical Storm Debby, and the remote technical analysis conducted to support project development.

Section 7: Mitigation Trends and Engineering Techniques (Pg. 87)

A technical overview of current and emerging flood mitigation and stream stabilization practices, such as erosion control and bank stabilization measures, bioengineering techniques, and innovative floodplain management strategies. This section contextualizes field observations within the broader body of engineering best practices.

Section 8: Project Fieldwork and Data Overview (Pg. 91)

The centerpiece of the document, featuring imagery, site descriptions, and data collected during field assessments throughout the Cowanesque Valley. This section highlights observed damages, erosion sites, and areas requiring stabilization, as well as opportunities for proactive mitigation.

Section 9: Project Reference Table (Pg. 201)

A summary table cataloging each identified project site, cross-referenced with the fieldwork findings, permitting requirements, potential funding sources, and recommended next steps.

Section 10: Map Inserts – Site Review / Project Locations

A set of cartographic products pinpointing project locations throughout the Tioga River Basin, including overlays of recent high-resolution aerial imagery, supporting layers such as parcels and municipal service boundaries. These map products also note that the locations correspond directly to the “Map-IDs” referenced in the Project Fieldwork and Data Overview section, ensuring consistency and cross-referencing between narrative, tabular, and spatial components of the document.

Closing Note & Disclaimer

This is a living document, subject to revision as additional information becomes available, stakeholder input is incorporated, and project priorities evolve. Contact information, hyperlinking, and technical appendices will be updated in future editions. Additionally, comprehensive web-based interactive maps are currently in development and will be published to complement the material contained herein.



[Web Mapping Application \(Click Here\)](#)

Disclaimer

The images and hyperlinks on this page link to a companion web mapping application that supports the content of this Legislative Master Document. Please note that Tioga County may update or modify the web map at any time, as it serves as a dynamic, living resource. Hyperlinks within the map and this document may change or become inactive over time. Users are therefore responsible for locating updated links by referencing the related sections and content in this document.

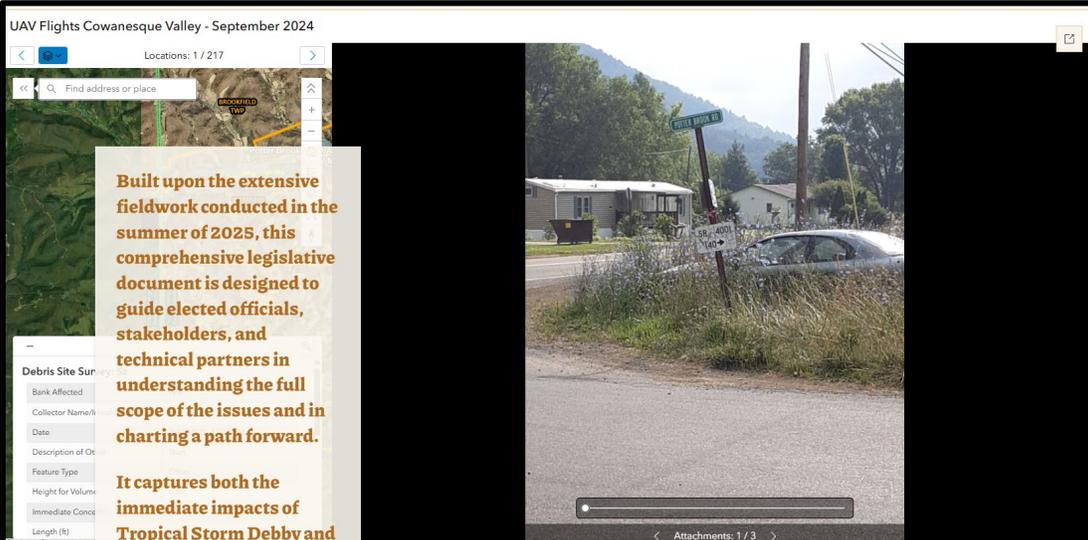


The top section of the slide features a composite image. On the left is a map of Tioga County, Pennsylvania, showing various townships and UAV flight areas. On the right is a photograph of a riverbank with fallen trees and debris, illustrating the impact of flooding.

Legislative Master Document

Tropical Storm Debby Flooding Event:
Cowanessque Valley Field Survey - Summer of 2025

Published By: Tioga County (PA) GIS Department
September 22, 2025



The bottom section shows a screenshot of a web mapping application interface. It includes a search bar, a map view, and a data table for debris sites. A text box highlights the document's purpose, and a photo of a residential street with debris is shown on the right.

UAV Flights Cowanessque Valley - September 2024

Locations: 1 / 217

Find address or place

Built upon the extensive fieldwork conducted in the summer of 2025, this comprehensive legislative document is designed to guide elected officials, stakeholders, and technical partners in understanding the full scope of the issues and in charting a path forward.

It captures both the immediate impacts of Tropical Storm Debby and

Debris Site Sur
Bank Affected
Collector Name/s
Date
Description of Ob
Feature Type
Height for Volum
Immediate Conco
Length (ft)

Attachments: 1 / 3



Cover Page – Legislative Contacts

Elected officials (legislative/advocacy help)

- **PA State Rep. Clint Owlet (HD-68)** – District office: 74 Main St, Wellsboro, PA 16901 • **(570) 724-1390**. Capitol: (717) 772-5371. [\(Click Here\)](#)
- **PA State Sen. Gene Yaw (SD-23)** – Wellsboro office: 5 Main St, Wellsboro, PA 16901 • **(570) 724-5231**. Williamsport office: 175 Pine St, Suite 105, Williamsport, PA 17701 • **(570) 322-6457**. Capitol: (717) 787-3280. [\(Click Here\)](#)
- **U.S. Rep. Glenn “GT” Thompson (PA-15)** – Bellefonte District Office: 3555 Benner Pike, Suite 101, Bellefonte, PA 16823 • **(814) 353-0215**. DC: (202) 225-5121. (Tioga County is in PA-15.) [\(Click Here\)](#) & [\(Click Here\)](#)
- **U.S. Sen. John Fetterman** – Harrisburg office: 320 Market St, Suite 475E, Harrisburg, PA 17101 • **(717) 782-3951**. Wilkes-Barre: 7 N Wilkes-Barre Blvd, Suite 406 • **(570) 820-4088**. DC: (202) 224-4254. [\(Click Here\)](#)
- **U.S. Sen. Dave McCormick** – Harrisburg office: 200 N Third St, Suite 14A, Harrisburg, PA 17101 • **(717) 231-7540**. State College: 329 Innovation Blvd, Suite 226 • **(814) 357-0314**. DC: (202) 224-6324. [\(Click Here\)](#)

County government & emergency contacts

- **Tioga County Commissioners** – 118 Main St, Wellsboro, PA 16901 • **(570) 723-8209**. [\(Click Here\)](#)
- **Tioga County Dept. of Emergency Services / EMA & 911** – 99 William Farrell Dr, Wellsboro, PA 16901 • **(570) 724-9110** (admin); non-emergency **(570) 724-4666**; outside-area emergency **(570) 724-7911**. [\(Click Here\)](#)
- **Tioga County Conservation District** (Chapter 105 GP coordination/erosion & sediment control) – 1867 Shumway Hill Rd, Wellsboro, PA 16901 • **(570) 724-1801**
etomlinson@tiogacountypa.us
- **Municipal officials directory** (townships/boroughs along the Cowanesque, e.g., Osceola, Deerfield, Elkland, Knoxville, Westfield, Lawrenceville): Northern Tier Regional Planning’s Tioga County directory (contacts, meeting info). [\(Click Here\)](#)



State agencies (permits & field enforcement)

- **PA DEP – Northcentral Regional Office (Williamsport)** – 208 W. Third St, Suite 101, Williamsport, PA 17701 • **(570) 327-3636 (24-hour line)**. Handles **Chapter 105** Water Obstruction & Encroachment permits, including **Emergency Permits** for imminent threats (often same-day). [\(Click Here\)](#)
 - Chapter 105 emergency-permit rule (§105.64) summary. [\(Click Here\)](#)
- **PA Fish & Boat Commission – Northcentral Region (Law Enforcement & Habitat)** – 595 E. Rolling Ridge Dr, Bellefonte, PA 16823 • **(814) 359-5250** (Law Enforcement); **(814) 359-5127** (Outreach). (PFBC reviews/coordination for in-stream work; GP-3 bank stabilization often applies.) [\(Click Here\)](#)
- **PennDOT – Engineering District 3-0** (for debris at state bridges/culverts; roadway-stream interfaces) – District Office: 715 Jordan Ave, Montoursville, PA 17754 • **(570) 368-8686**. **Tioga County Maintenance Office**: 6 Berwart St, Wellsboro, PA 16901 • **(570) 724-4142**. [\(Click Here\)](#) & [\(Click Here\)](#)

Federal agencies & programs

- **U.S. Army Corps of Engineers – Tioga-Hammond & Cowanesque Lakes (Baltimore District)** – Ives Run Visitor Center, **710 Ives Run Lane, Tioga, PA 16946** • **(570) 835-5281** (project office/rangers). (Covers dams, federal shorelines, and some post-flood debris coordination on project lands/waters.) [\(Click Here\)](#)
- **FEMA Region 3** (Philadelphia) – General line **(215) 931-5608** (for federal disaster assistance coordination; public assistance/mitigation programs). [\(Click Here\)](#)
- **USDA NRCS – Tioga County Service Center** (Emergency Watershed Protection (EWP) & technical help for streambank stabilization) – **50 Plaza Lane, Wellsboro, PA 16901** • **(570) 948-4112**. State EWP contacts also listed by NRCS; you can also find local offices via the USDA Service Center locator. [\(Click Here\)](#) & [\(Click Here\)](#) & [\(Click Here\)](#)

Handy references (what to ask about)

- **DEP Flood/Storm Guidance & Emergency Permitting** – process overview and links for expedited Chapter 105 Emergency Permits. [\(Click Here\)](#)
 - **Tioga County directory pages** (departments, commissioners, ES/EMA). [\(Click Here\)](#)
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Quick usage tips

1. If work is urgent (undercutting banks threatening structures, blocked culverts, etc.), call **DEP Northcentral (570-327-3636)** and ask about a **Chapter 105 Emergency Permit**; they can often issue same-day approvals to stabilize or remove hazards. [\(Click Here\)](#)
2. Coordinate with **PFBC Northcentral** on any **in-stream** activities (they cover fish passage & habitat and may advise on timing, species considerations). [\(Click Here\)](#)
3. For debris at **state bridges/roads**, contact **PennDOT District 3** (or the **Tioga County Maintenance Office** directly). [\(Click Here\)](#)
4. If sites are near **USACE project lands/waters** (Tioga-Hammond or Cowanesque), loop in the **Corps project office**. [\(Click Here\)](#)
5. For **funding/engineering help** on streambank stabilization after disasters, call **NRCS (EWP)** via the local Service Center. [\(Click Here\)](#)



Section 2

Stakeholder and

Regional Contact

Directory



Contacts – Master List

Who to call

- **Stream work + permitting (Chapter 105, GP-3 bank stabilization, debris at crossings):**
Tioga County Conservation District (TCCD) — delegated by PA DEP for specified 105 general permits. [\(Click Here\)](#)
 - **PA DEP Northcentral Regional Office (NCRO)** — emergency permits, debris removal guidance; 24-hour line. [\(Click Here\)](#)
 - **Fish/wildlife concerns during in-stream work:**
PA Fish & Boat Commission (PFBC) – Northcentral Region (Bellefonte). [\(Click Here\)](#)
 - **State forest/State land stream issues:**
DCNR – Tioga State Forest District Office (Wellsboro). [\(Click Here\)](#)
 - **Work at/near Cowanesque or Tioga-Hammond Lakes; dam releases; lake debris/shoreline:**
U.S. Army Corps of Engineers (USACE) – Tioga-Hammond & Cowanesque Lakes Project Office (Tioga, PA). For federal permitting (Section 404), use **USACE Baltimore District Regulatory Branch**. [\(Click Here\)](#)
 - **Bridges/culverts on state routes; debris at state structures:**
PennDOT District 3-0 (Montoursville) and Tioga County Maintenance Office. [\(Click Here\)](#)
 - **Water withdrawals (e.g., pumps for dewatering/repairs):**
Susquehanna River Basin Commission (SRBC) (Harrisburg HQ; Sayre field office). [\(Click Here\)](#)
 - **Emergency watershed stabilization funding/technical help:**
USDA-NRCS – Wellsboro Service Center (EWP program). [\(Click Here\)](#) & [\(Click Here\)](#)
 - **Emergency coordination, damage reporting:**
Tioga County Emergency Services (EOC) — 911 in-county; admin & non-emergency lines below. [\(Click Here\)](#)
 - **Debris disposal / transfer stations (construction & flood debris):**
Northern Tier Solid Waste Authority (NTSWA) sites in Tioga County. [\(Click Here\)](#)
 - **Mapping (flood layers, parcels) / data support:**
Tioga County GIS Department (Basemap Viewer; NFHL instructions). [\(Click Here\)](#)
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Key agencies

Tioga County Conservation District (TCCD) – *Chapter 102/105 assistance, GP registrations, site visits*
1867 Shumway Hill Rd, Wellsboro, PA 16901 • **(570) 724-1801** • M–F 8:00–4:30. [\(Click Here\)](#)

PA DEP, Northcentral Regional Office (NCRO) – *Emergency permits; debris removal approvals; 24-hr line*
208 W 3rd St, Suite 101, Williamsport, PA 17701 • **(570) 327-3636 (24/7)**. Debris-removal & emergency-permit guidance linked. [\(Click Here\)](#) & [\(Click Here\)](#)

PFBC – Northcentral Region Office – *in-stream work coordination, launches/accesses, enforcement*
595 E Rolling Ridge Dr, Bellefonte, PA 16823 • **(814) 359-5250 (Law Enforcement)** • RA-FBNCRLE@pa.gov. [\(Click Here\)](#)

DCNR – Tioga State Forest District Office – *state land/stream work on DCNR property*
One Nessmuk Ln, Wellsboro, PA 16901 • **(570) 724-2868**. [\(Click Here\)](#)

USACE – Tioga-Hammond & Cowanesque Lakes Project Office – *dam/lake ops; shoreline/lake issues*
710 Ives Run Ln, Tioga, PA 16946 • **(570) 835-5281**. [\(Click Here\)](#)

USACE – Baltimore District, Regulatory Branch – *Section 404 permitting; joint coordination with DEP*
General Regulatory line **(814) 235-1763** • NAB-Regulatory@usace.army.mil. [\(Click Here\)](#)

PennDOT – Engineering District 3-0 (Regional) – *state bridges/culverts on numbered routes*
715 Jordan Ave, Montoursville, PA 17754 • **(570) 368-8686**. **Tioga County Maintenance Office:** 6 Berwart St, Wellsboro, PA 16901 • **(570) 724-4142**. [\(Click Here\)](#)

USDA-NRCS – Wellsboro Service Center – *EWP emergency watershed stabilization; local intake*
50 Plaza Ln, Wellsboro, PA 16901 • **(570) 724-4812** (NRCS/FSA shared center). EWP overview here. [\(Click Here\)](#) & [\(Click Here\)](#)

SRBC (Susquehanna River Basin Commission) – *water withdrawal approvals & coordination*
HQ: 4423 N Front St, Harrisburg, PA 17110 • **(717) 238-0423**; Field Office: 1760 Elmira St, Sayre, PA 18840 • **(570) 731-4839**. [\(Click Here\)](#)

Tioga County Department of Emergency Services – *EOC, damage reporting & coordination*
99 William Farrell Dr, Wellsboro, PA 16901 • **(570) 724-9110** (admin) • **(570) 724-4666** (non-emergency)
• **Dial 911** for emergencies. [\(Click Here\)](#)

Tioga County GIS Department – *parcel, flood (NFHL), hydrology layers; basemap viewer*
118 Main St, Wellsboro, PA 16901 • **(570) 723-8253**. Basemap Viewer; NFHL instructions on Floodplain Admin page. [\(Click Here\)](#)

Northern Tier Solid Waste Authority (NTSWA) – *debris disposal, landfill & transfer stations*
Tioga County Landfill/Transfer: 540 Old Bloss Rd, Blossburg, PA 16912 • **(570) 638-2107**. Tiadaghton Transfer (Wellsboro): 10455 US-6 • **(570) 724-0145**. [\(Click Here\)](#)



Develop Tioga (County development office) – business/resident connection to flood recovery resources
Office: (570) 723-8232 • info@developtioga.org. [Develop Tioga](http://DevelopTioga.org)

Municipal contacts along the Cowanesque River/Lake corridor

- *(Local floodplain permits are issued at the municipal level; these offices can route you to the Floodplain Administrator.)*
[Full county list “District Secretaries – 2025” updated Aug 18, 2025 is HERE.](#)
- **Westfield Borough** — 429 E Main St, Westfield, PA 16950 • **(814) 367-2632** • wboro@verizon.net.
- **Westfield Township** — 528 Mill St, Westfield, PA 16950 • **(814) 367-5688** • westfieldtwp@aol.com.
- **Brookfield Township** — 2205 California Rd, Westfield, PA 16950 • **(814) 367-5572** • brooktwp@verizon.net.
- **Knoxville Borough** — PO Box 191, Knoxville, PA 16928 • **(814) 326-4126** • knoxvilleboro@yahoo.com.
- **Deerfield Township** — 5322 State Rte 49, Knoxville, PA 16928 • **(814) 326-4930** • deerfieldtownshiptiogacounty@yahoo.com.
- **Elkland Borough** — 105 Parkhurst St, Elkland, PA 16920 • **(814) 258-7322** • elklandboro@gmail.com.
- **Osceola Township** — PO Box 146, Osceola, PA 16942 • **(814) 258-5411** • osceolatwp@yahoo.com.
- **Nelson Township** — PO Box 119, Nelson, PA 16940 • **(570) 827-7892** • nelsontp@epix.net.
- **Farmington Township** — 19 Elkhorn Rd, Lawrenceville, PA 16929 • **(570) 827-3016** • farmingtontwp19@gmail.com.
- **Lawrence Township** — 1038 Buckwheat Hollow Rd, Lawrenceville, PA 16929 • **(570) 827-2254** • twp@epix.net.
- **Lawrenceville Borough** — 6 Mechanic St, Lawrenceville, PA 16929 • **(570) 827-2066** • watersewarsecretary@gmail.com.
- **Tioga Township** — 50 Coleman St, Tioga, PA 16946 • **(570) 835-5483** • tiogatwp@gmail.com.
- **Tioga Borough** — PO Box 158, Tioga, PA 16946 • **(570) 835-5226** • tbsecretary@tiogaborough.org.



Handy references (Permitting & debris)

- **Emergency debris removal from streams – what needs approval:** DEP fact sheet & guidance; many woody debris removals can be OK with phone approval if equipment stays out of the channel; emergency permits available where there's imminent risk.
- **Chapter 105 General Permits overview/fees:** Bank stabilization (GP-3), maintenance at crossings (GP-11), etc. [\(Click Here\)](#)
- **Report environmental incidents to DEP:** Online or **866-255-5158**.
- [Full county list "District Secretaries – 2025" updated Aug 18, 2025 is HERE.](#)

Flood Recovery Contacts – Cowanesque Valley (Tioga County, PA)

Who to Call – QUICK GUIDE

- Stream work & permitting: Tioga County Conservation District (TCCD), PA DEP Northcentral Regional Office (NCRO).
- Fish/wildlife concerns: PA Fish & Boat Commission (PFBC) – Northcentral Region.
- State forest/lands: DCNR – Tioga State Forest District Office.
- Work at/near Cowanesque or Tioga-Hammond Lakes: U.S. Army Corps of Engineers (USACE) Project Office & Baltimore District Regulatory.
- Bridges/culverts on state routes: PennDOT District 3-0 & Tioga County Maintenance Office.
- Water withdrawals: Susquehanna River Basin Commission (SRBC).
- Emergency watershed stabilization: USDA-NRCS – Wellsboro Service Center.
- Emergency coordination/damage reporting: Tioga County Emergency Services (EOC).
- Debris disposal: Northern Tier Solid Waste Authority (NTSWA).
- Mapping/data support: Tioga County GIS Department.

Key Agencies & Contacts

Tioga County Conservation District (TCCD)

1867 Shumway Hill Rd, Wellsboro, PA 16901
 (570) 724-1801
 M–F 8:00–4:30

PA DEP – Northcentral Regional Office (NCRO)

208 W 3rd St, Suite 101, Williamsport, PA 17701
 (570) 327-3636 (24/7)



PFBC – Northcentral Region Office

595 E Rolling Ridge Dr, Bellefonte, PA 16823
 (814) 359-5250 (Law Enforcement)
 RA-FBNCRLE@pa.gov

DCNR – Tioga State Forest District Office

One Nessmuk Ln, Wellsboro, PA 16901
 (570) 724-2868

USACE – Tioga-Hammond & Cowanesque Lakes Project Office

710 Ives Run Ln, Tioga, PA 16946
 (570) 835-5281

USACE – Baltimore District, Regulatory Branch

General Regulatory line: (814) 235-1763
 NAB-Regulatory@usace.army.mil

PennDOT – Engineering District 3-0

715 Jordan Ave, Montoursville, PA 17754
 (570) 368-8686
 Tioga County Maintenance Office: 6 Berwart St, Wellsboro, PA 16901
 (570) 724-4142

USDA-NRCS – Wellsboro Service Center

50 Plaza Ln, Wellsboro, PA 16901
 (570) 724-4812

SRBC – Susquehanna River Basin Commission

HQ: 4423 N Front St, Harrisburg, PA 17110
 (717) 238-0423
 Field Office: 1760 Elmira St, Sayre, PA 18840
 (570) 731-4839

Tioga County Department of Emergency Services

99 William Farrell Dr, Wellsboro, PA 16901
 (570) 724-9110 (admin)
 (570) 724-4666 (non-emergency)
 Dial 911 for emergencies



Tioga County GIS Department

118 Main St, Wellsboro, PA 16901

(570) 723-8253

Northern Tier Solid Waste Authority (NTSWA)

Landfill: 540 Old Bloss Rd, Blossburg, PA 16912 – (570) 638-2107

Tiadaghton Transfer (Wellsboro): 10455 US-6 – (570) 724-0145

Develop Tioga

(570) 723-8232

info@developtioga.org

Municipal Contacts – Cowanesque River/Lake Corridor

Westfield Borough

429 E Main St, Westfield, PA 16950

(814) 367-2632

wboro@verizon.net

Westfield Township

528 Mill St, Westfield, PA 16950

(814) 367-5688

westfielddtw@aol.com

Brookfield Township

2205 California Rd, Westfield, PA 16950

(814) 367-5572

brooktwp@verizon.net

Knoxville Borough

PO Box 191, Knoxville, PA 16928

(814) 326-4126

knoxvilleboro@yahoo.com

Deerfield Township

5322 State Rte 49, Knoxville, PA 16928

(814) 326-4930

deerfieldtownshiptiogacounty@yahoo.com



Elkland Borough

105 Parkhurst St, Elkland, PA 16920
(814) 258-7322
elklandboro@gmail.com

Osceola Township

PO Box 146, Osceola, PA 16942
(814) 258-5411
osceolatwp@yahoo.com

Nelson Township

PO Box 119, Nelson, PA 16940
(570) 827-7892
nelsontp@epix.net

Farmington Township

19 Elkhorn Rd, Lawrenceville, PA 16929
(570) 827-3016
farmingtontwp19@gmail.com

Lawrence Township

1038 Buckwheat Hollow Rd, Lawrenceville, PA 16929
(570) 827-2254
twp@epix.net

Lawrenceville Borough

6 Mechanic St, Lawrenceville, PA 16929
(570) 827-2066
watersewersecretary@gmail.com

Tioga Township

50 Coleman St, Tioga, PA 16946
(570) 835-5483
tiogatwp@gmail.com

Tioga Borough

PO Box 158, Tioga, PA 16946
(570) 835-5226
tbsecretary@tiogaborough.org



Section 3

Permitting Resources



Permitting Resources

➤ Tioga County Conservation District

Chapter 105 - Wetlands and Stream Encroachments Regulations and Legislation: Under the delegation of the Pennsylvania Department of Environmental Protection, The Tioga County Conservation District is responsible for permitting, inspecting and monitoring specified categories of water obstructions and encroachments.

[Chapter 105 General Permits – Pennsylvania DEP \(Hyperlinked\)](#)

- GP-1: Fish Enhancement Structures
- GP-2: Private Recreational Docks
- GP-3: Bank Rehabilitation and Protection
- GP-4: Intake and Outfall Structures
- GP-5: Utility Line Stream Crossings
- GP-6: Agricultural Crossings and Ramps
- GP-7: Minor Road Crossings
- GP-8: Temporary Road Crossings
- GP-9: Agricultural Activities

➤ [NRCS Program – Watershed Protection & Flood Prevention \(Hyperlinked\)](#)

➤ PA Department of Environmental Protection Permits

GP-11: Maintenance, Testing, Repair, Rehabilitation, or Replacement of Water Obstructions and Encroachments.

Joint Permits

Special Projects Permits – These apply to projects that fall outside the scope of a General Permit, such as work involving more than 500 feet of stream or projects located in a special protection watershed.

➤ Pennsylvania Department of Transportation

Highway Occupancy Permit: Required for any work within PennDOT's right-of-way.

➤ Municipal

Floodplain Permit: Required for any work taking place within a designated floodplain.



Additional Information – Permitting

Who regulates what (Cowanesque Valley)

- **Primary state authority – PA DEP, Chapter 105 (Water Obstruction & Encroachment).** General Permits (GPs) commonly used here include **GP-3 (Bank Rehab/Protection & Gravel Bar Removal)**, **GP-7 (Minor Road Crossings)**, **GP-8 (Temporary Road Crossings)**, **GP-11 (Maintenance/repair of existing structures)**. Registration is via DEP e-Permitting. ([Click Here](#)) & ([Click Here](#))
- **Local help – Tioga County Conservation District (delegated Chapter 105 work).** 1867 Shumway Hill Rd, Wellsboro, PA 16901; **(570) 724-1801**. They're your first stop for site reviews, GP questions, and submissions. ([Click Here](#))
- **U.S. Army Corps of Engineers (USACE).** In PA, most small Chapter 105 activities also satisfy federal §404 via the **PA State Programmatic General Permit (PASPGP)**; **bank stabilization** is also covered by **Nationwide Permit 13 (NWP 13)** with PA/Philadelphia-District regional conditions that prefer bioengineering unless you justify otherwise. ([Click Here](#)) & ([Click Here](#)) & ([Click Here](#))
- **Water quality designations.** The **Cowanesque River main stem in PA is WWF, MF** (Warm Water Fishes, Migratory Fishes). Tributaries may carry trout designations, which can trigger time-of-year (TOY) work restrictions in permits. ([Click Here](#)) & ([Click Here](#))

What you can do immediately after flooding (no/full/fast approvals)

Debris & emergency actions

- **Call DEP before touching the channel** (they can give **telephone approvals** for true emergencies like debris blocking flows or backing up at crossings). 24/7 DEP emergency line: **1-800-541-2050**. ([Click Here](#))
- **Simple debris removal:** Hand removal of **woody debris from the banks** (no equipment in the stream and **no gravel/sediment** removal) is generally **permit-free**. For obstructions at bridges/culverts, use DEP's **Channel Cleaning Standards** (work limited to **50 ft** upstream/downstream, minimize disturbance). ([Click Here](#)) & ([Click Here](#))
- **Sediment/gravel removal or channel reshaping** (including gravel bars) **does require a permit** under Chapter 105; owners **must maintain** bridge/culvert openings and may remove silt/debris per DEP standards. ([Click Here](#)) & ([Click Here](#))



- **Emergency Permit:** If you must **enter the channel or armor banks immediately**, DEP can issue an **Emergency Permit**; see DEP fact sheet on emergency stream debris removal. [\(Click Here\)](#)

Core permits you'll use (post-Debbie recovery)

- **GP-3: Bank Rehabilitation/Protection & Gravel Bar Removal**
Typical uses: rock/bioengineered toe, live staking, and **removal of short gravel bars** (\leq ~500 ft reach) **only down to ~6 inches above** the water level at time of work. Register via e-Permitting. [\(Click Here\)](#) & [\(Click Here\)](#)
- **GP-11: Maintenance, testing, repair, rehab, or replacement of existing permit ed structures** (e.g., repairing a damaged abutment/wingwall). [\(Click Here\)](#)
- **GP-7 / GP-8:** For **minor or temporary road crossings** needed for access during recovery. [\(Click Here\)](#)
- **USACE (federal):** Most Ch.105 GPs are covered federally under **PASPGP**; for standalone federal coverage of bank work, **NWP 13** authorizes bank stabilization and **PA regional conditions** favor bioengineering or a practicability analysis if you use hard armoring alone. [\(Click Here\)](#)

Fees & submissions

- Register GPs through **DEP e-Permitting (GreenPort)**; DEP's training videos and user guides are excellent. **Typical GP-3 fee \approx \$250** per project (municipal agencies may be fee-exempt; always confirm with the District). [\(Click Here\)](#)

Other likely requirements

- **PNDI / Conservation Explorer** screening for threatened & endangered species is standard before DEP/USACE authorizations. [\(Click Here\)](#)
- **E&S / NPDES (Chapter 102):** If **earth disturbance \geq 1 acre**, you'll also need a construction stormwater permit and E&S plan. [\(Click Here\)](#)
- **TOY restrictions:** Permits often impose **time-of-year windows** on trout waters; PFBC provides guidance/waiver processes in flood response scenarios (still coordinate early). [\(Click Here\)](#)

Funding & programs that pair with permits (post-disaster)

- **FEMA Public Assistance (Category A – Debris Removal)** for municipalities: follow **PAPPG** and FEMA's **Debris Removal guidance** (monitoring, documentation, environmental



compliance). Private Property Debris Removal (PPDR) has stricter tests/ROE requirements. [\(Click Here\)](#)

- **USDA-NRCS Emergency Watershed Protection (EWP):** Cost-share for **streambank stabilization, debris removal, culvert/bridge clearing**, etc., via a local sponsor (county/municipality/CD). **DEP's Stream Improvement Program** sometimes partners to cover match. [\(Click Here\)](#)

Cowanesque-specific notes to keep you out of trouble

- **Designations & species:** Cowanesque main stem is **WWF/MF**; check each **tributary** for trout/wild-trout status (TOY restrictions & added protections may apply). Use PFBC/DEP layers or Conservation Explorer during scoping. [\(Click Here\)](#)
- **Bioengineering first:** Expect reviewers (and USACE regional conditions) to **favor bioengineered stabilization**; if you need riprap or walls, include a brief **practicability analysis** showing why. [\(Click Here\)](#)

Gravel bar work (GP-3): Bar removal is **limited reach and depth** (e.g., ~6" above water surface during the project). Don't "straighten" channels. GP-3 projects under 250 ft can be approved through the district or DEP, but projects involving gravel bars between 250–500 ft require approval from the U.S. Army Corps of Engineers (USACE). [\(Click Here\)](#)

- **Crossings:** For **bridge/culvert cleanouts**, stick to the **50-ft** standard windows and minimize disturbance; owners are responsible for maintaining capacity and removing obstructions when **>10%** area is lost.



Section 4

Funding Sources



Funding Sources

Phase 1 — Immediate debris removal & emergency stabilization

- **FEMA Public Assistance (PA) – Category A (Debris Removal).** Reimburses eligible local governments for debris removal; see FEMA’s Category A sheet and debris-monitoring guidance for documentation you’ll need (types/quantities, reduction methods, pickup/disposal locations, etc.). [\(Click Here\)](#)
- **USDA-NRCS Emergency Watershed Protection (EWP).** Covers emergency measures like *removing stream debris* and *stabilizing eroded streambanks* via a public sponsor (municipality, conservation district). Pennsylvania has a state page + contacts; a Presidential disaster declaration is **not** required. [\(Click Here\)](#)
- **PA DEP Stream Improvement Program (SIP).** State crews **design & construct small projects** to repair flood-damaged channels and *stabilize banks where homes/roads are imminently threatened*. Great gap-filler alongside EWP/PA. [\(Click Here\)](#)
- **USDA Farm Service Agency — Emergency Conservation Program (ECP).** For *private farmland*: stream/flood debris removal, grading, fence repair, practice restoration; cost-share to 75–90% depending on producer eligibility. Apply through the local FSA office. [\(Click Here\)](#)

Phase 2 — Engineering-grade streambank stabilization & road/bridge protection

- **USACE Continuing Authorities Program (CAP) – Section 14 (Emergency Streambank & Shoreline Protection).** Partners with a *non-federal sponsor* to protect public facilities (roads, bridges, plants, schools, etc.) from imminent bank failure; federal cap typically **\$5M per site**. [\(Click Here\)](#)
- **USACE CAP – Section 205 (Small Flood Risk Management).** For localized flood-risk fixes (levees, floodwalls, diversions, warning systems). Typical cost-share: first \$100k of study at 100% federal, then study 50/50; construction often 65/35. [\(Click Here\)](#)
- **USACE CAP – Section 206 (Aquatic Ecosystem Restoration).** Funds stream restoration that improves environmental quality (can pair with stabilization/habitat). USACE Baltimore District shows 65/35 construction cost-share, \$15M federal limit. [\(Click Here\)](#)

Phase 3 — Long-term restoration, mitigation & buffers (design → construction)



- **DEP Growing Greener Plus.** Core PA restoration program for *stream restoration, bank/shoreline stabilization, buffers, stormwater & ag BMPs*. 2025 round ran Apr 22–Jun 20; match was reduced to **5%** statewide this year (0% in EJ areas). Watch for the next annual round. [\(Click Here\)](#)
- **DEP Section 319 Nonpoint Source Grants.** For restoration in *impaired* watersheds using WIP/9-Element plans; the 2025 window also ran Apr 22–Jun 20 (multi-year subgrants). [\(Click Here\)](#) & [\(Click Here\)](#)
- **DCNR Community & Watershed Forestry / Riparian Buffer Grants.** Pays for riparian forest buffers (including innovative/multifunctional plantings) and lawn-to-meadow conversions—ideal for protecting newly stabilized banks. [\(Click Here\)](#)
- **USFWS Partners for Fish & Wildlife (Region 5).** *Private landowner* cost-share + technical assistance for riparian restoration, livestock exclusion, crossings, etc. (good in ag stream valleys). [\(Click Here\)](#)
- **Susquehanna River Basin Commission – Stream & Watershed Enhancement Micro-grants.** Small, fast dollars for on-the-ground watershed enhancements across the basin. [\(Click Here\)](#)
- **Foundation for Pennsylvania Watersheds (FPW).** Private PA funder; rolling spring/fall cycles. Useful for design/match and implementation on restoration/buffer projects. [\(Click Here\)](#)
- **Trout Unlimited – Embrace-A-Stream (via local TU chapters).** Matching grants for coldwater restoration/habitat—helps leverage state/federal funds. [\(Click Here\)](#)

FEMA mitigation programs (status as of today)

- **HMGP (post-declaration).** For buyouts, localized flood-risk reduction, and mitigation planning after a Major Disaster—administered by PEMA in PA. [\(Click Here\)](#)
- **FMA (annual).** Competitive grants targeting NFIP-insured, repetitively flooded buildings. Useful for culvert upsizing, small flood-risk reduction, and property acquisition where applicable. [\(Click Here\)](#)
- **BRIC.** The federal BRIC program was **terminated in April 2025** and is under active litigation by multiple states; do not count on a BRIC 2025 cycle unless courts reverse course. Plan around HMGP/FMA for now. [\(Click Here\)](#)



Local players & precedents in Tioga County

- **Tioga County Conservation District (Wellsboro).** Your first stop for EWP sponsorship, permits, landowner coordination, and Growing Greener partnerships. (Address & phone on county site.) [\(Click Here\)](#)
- **Recent DEP restorations in the region.** DEP’s 2025 announcements show Tioga County Conservation District receiving Growing Greener funds (e.g., Lycoming Creek Erosion Mitigation Phase 1), underscoring local eligibility/precedent. [\(Click Here\)](#)
- **State match for EWP after Debby.** DEP/PEMA publicly committed state match to EWP projects (flood recovery in multiple counties)—useful precedent for Cowanesque projects under the same program mechanics. [\(Click Here\)](#)

Recommended Sequence for Cowanesque Valley

1. Debris & immediate hazards (0–6 months).

- Document and pursue **FEMA PA Category A** for public debris removal; line up force-account/contract monitoring per FEMA guidance. [\(Click Here\)](#)
- Have Tioga CCD (or municipality) sponsor **NRCS EWP** sites where debris/unstable banks pose an *imminent threat*. [\(Click Here\)](#)
- Use **DEP Stream Improvement Program** for small, urgent sites threatening structures/roads. [\(Click Here\)](#)
- Advise farm landowners to apply for **FSA ECP**. [\(Click Here\)](#)

2. Stabilization & crossings (6–24 months).

- Advance **USACE CAP Sec 14** where public infrastructure is at risk from bank erosion; consider **Sec 205** where broader flood-risk reduction is warranted. [\(Click Here\)](#) & [\(Click Here\)](#)
- Start **design/permitting** for reach-scale restoration using **Growing Greener/319** as primary construction dollars next round. [\(Click Here\)](#)

3. Buffers & resilience (parallel, 6–36 months).

- Stack **DCNR riparian buffer funds** with **USFWS Partners** and **SRBC/FPW/TU** minis for plantings, fencing, crossings, and habitat. [\(Click Here\)](#) & [\(Click Here\)](#) & [\(Click Here\)](#) & [\(Click Here\)](#) & [\(Click Here\)](#)

4. Mitigation capital (annual/post-declaration).

- Package culvert/roadway upsizing and buyouts under **HMGP** and **FMA**, depending on NFIP status and eligibility. [\(Click Here\)](#) & [\(Click Here\)](#)



Quick-start checklist (people to call & actions)

- **Sponsor & damage triage:** Tioga County Conservation District + municipal managers (sponsor EWP/SIP). ([Click Here](#))
- **NRCS PA EWP point(s):** NRCS PA State Office (Water Resources & Programs contacts). ([Click Here](#))
- **Corps (district for Tioga Co.):** USACE Baltimore District—use CAP for Section 14/205/206 inquiries. ([Click Here](#))
- **PEMA Mitigation Unit:** scope HMGP/FMA readiness (adoption status of the county HMP, BCA needs, properties). ([Click Here](#))
- **DEP Growing Greener/319:** prep for next application window; review 2025 guidance/setup now. ([Click Here](#))
- **DCNR buffers:** contact regional advisor for riparian buffer grants.

**** See Funding Matrix on the Following Page ****



Program	What it Funds	Eligible Applicants	Cost-Share / Match	Timing / Deadline	Notes / Local Use Cases
FEMA Public Assistance – Cat A	Debris removal (public land/ROWs)	Municipality, county, state	75–100% (varies by declaration)	Open after disaster declaration	Track/document debris removal; force account eligible
NRCS EWP	Stream debris removal, bank stabilization (emergency)	Municipality, county, CCD sponsor	75% fed / 25% local (state sometimes covers match)	Rolling, post-event	Sponsor submits DSRs; no disaster declaration required
DEP Stream Improvement Program	Small urgent channel/bank repairs	Municipality, CCD	100% state (DEP crews)	Rolling, as DEP resources allow	Good for imminent threats to homes/roads
FSA Emergency Conservation Program (ECP)	Private farmland debris cleanup, grading, fence repair	Private farmers	75–90% cost-share	Post-event signup	Apply at local FSA office
USACE CAP Sec 14	Bank protection for public facilities (roads, bridges, etc.)	Municipality, county sponsor	65% fed / 35% local, \$5M fed cap	LOI anytime	Use for high-value public infrastructure
USACE CAP Sec 205	Localized flood risk reduction (levees, diversions, culverts)	Municipality, county sponsor	65/35 construction ; 50/50 study (first \$100k study at 100% fed)	LOI anytime	Broader reach-scale fixes
USACE CAP Sec 206	Aquatic ecosystem restoration (habitat/stream)	Municipality, CCD sponsor	65/35; \$15M fed cap	LOI anytime	Can align with habitat & stabilization
DEP Growing Greener Plus	Stream restoration, stabilization, buffers, BMPs	Municipality, CCD, nonprofits	95/5 (5% match; 0% in EJ areas)	Annual; Apr–Jun	Primary state construction program
DEP Section 319	Watershed restoration / impaired streams	Municipality, CCD, nonprofits	Usually 25% match	Annual; Apr–Jun	Requires WIP/9E plan
DCNR Riparian Buffer Grants	Buffers, lawn-to-meadow conversion	Municipality, CCD, nonprofits, land trusts	50–100% depending	Annual/rolling	Pairs with stabilization projects



USFWS Partners for Fish & Wildlife	Private-land riparian buffers, crossings, livestock exclusion	Private landowners (with partners)	50–75% cost-share	Rolling	Good for ag stream valleys
SRBC Micro-grants	Small watershed enhancement projects	CCD, watershed orgs, municipalities	Typically \$2–10k per site	Annual cycles	Useful for small, fast wins
Foundation for PA Watersheds	Watershed restoration, match support	Nonprofits, CCD, municipalities	Varies (grant cycles)	Spring/Fall deadlines	Flexible private dollars
Trout Unlimited Embrace-A-Stream	Habitat restoration (coldwater)	TU chapters/partners	Match required; small grants	Annual TU cycle	Adds leverage
FEMA HMGP	Buyouts, culverts, flood mitigation post-disaster	Municipality via PEMA	75% fed / 25% local	Post-disaster declaration	Must align w/ county HMP
FEMA FMA	NFIP-insured repetitive loss properties; culverts	Municipality via PEMA	75–90% fed / 10–25% local	Annual	Target NFIP properties
FEMA BRIC	Discontinued April 2025 (litigation ongoing)	N/A	N/A	N/A	Do not rely on BRIC
Program	What it Funds	Eligible Applicants	Cost-Share / Match	Timing / Deadline	Notes / Local Use Cases



Section 5

Quick-Start Links



Quick-Start Links

Quick-start (who to call first)

- **Your municipal Floodplain Administrator** – local **floodplain development permit** is required before most work in the mapped floodplain. Tioga County keeps the contacts for every municipality. ([Click Here](#))
- **PA DEP – Northcentral Regional Office (Williamsport)** – Chapter 105 stream permits & **Emergency Permits** (same-day possible when there’s an imminent threat). Phone **570-327-3636** (24/7). ([Click Here](#))
- **Tioga County Conservation District (TCCD)** – delegated help for minor/General Permit registrations and Chapter 102 erosion & sedimentation questions/fee schedule. ([Click Here](#))
- **PA One Call (811)** – call **3–10 business days before** any excavation or heavy equipment work. ([Click Here](#))

Federal programs & regulators

- **NRCS – Emergency Watershed Protection (EWP)** – funding/technical help for **debris removal from channels, culverts & bridges; bank protection; drainage fixes**. Coordinate early so FEMA funding isn’t jeopardized. ([Click Here](#))
- **FEMA Public Assistance (Category A – Debris)** – debris removal eligibility + coordination note with NRCS EWP. ([Click Here](#))
- **U.S. Army Corps of Engineers (USACE)** – Section 404 dredge/fill permitting is streamlined in PA under **PASPGP-6** (joint with DEP); Cowanesque Lake/Tioga-Hammond projects are managed by USACE Baltimore District. (National **RRS** portal is available, but most PA projects still use the DEP joint process.) ([Click Here](#))

Pennsylvania permits (what typically applies)

- **Chapter 105 – Water Obstruction & Encroachment**
 - **Emergency Permits (DEP)** – for imminent threats to life/property/environment. ([Click Here](#))
 - **General Permits (GPs)** – the ones most used after floods:
 - **GP-3: Bank Rehabilitation / Bank Protection / Gravel Bar Removal.** ([Click Here](#)) & ([Click Here](#))
 - **GP-7: Minor Road Crossings and GP-8: Temporary Road Crossings** (access to sites). ([Click Here](#))



- **GP-11: Maintenance/Repair/Rehabilitation/Replacement** of existing water obstructions (culverts/bridges). [\(Click Here\)](#)
- Full GP list + forms are in DEP's **eLibrary** and **General Permits** pages. [\(Click Here\)](#) & [\(Click Here\)](#)
- **Routine channel cleaning at bridges/culverts** (≤50 ft upstream/downstream) can be done as maintenance when done per DEP **Standards for Channel Cleaning** (keep hydraulic opening clear; >10% loss triggers action). [\(Click Here\)](#) & [\(Click Here\)](#) & [\(Click Here\)](#)
- **Chapter 102 – Erosion & Sediment Control**
 - Disturbance ≥5,000 sq ft requires an **E&S Plan**; ≥1 acre requires an **NPDES (PAG-02)** construction stormwater permit (2024 PAG-02 now in effect). Coordinate with TCCD/DEP. [\(Click Here\)](#) & [\(Click Here\)](#)
- **Fish & Boat Commission (PFBC) – In-stream timing**
 - The **Cowanesque River is a stocked trout fishery**; in-stream construction typically restricted **Mar 1–Jun 15** unless PFBC grants written permission or a waiver (PFBC issued a stocked-trout **restriction waiver** framework used with Chapter 105 projects). Always check current timing with PFBC. [\(Click Here\)](#) & [\(Click Here\)](#)

Local & site-specific

- **Municipal Floodplain Permit** – required prior to repairs in floodplain; FEMA Region III's guidance reminds applicants to get local permits **before** doing work. [\(Click Here\)](#)
- **Tioga County GIS Map Viewer** – to verify parcels, flood layers, and access planning. [\(Click Here\)](#)
- **USACE Cowanesque Lake lands** – if staging or accessing via federal project lands/shorelines, coordinate with the Cowanesque project office (USACE Baltimore District). [\(Click Here\)](#)
- **DCNR / Tioga State Forest** – if access, staging, or work roads are on state forest land, coordinate permits/authorizations with the Tioga State Forest district office. [\(Click Here\)](#)

How the process fits together (Cowanesque Valley)

1. **Call your municipal Floodplain Administrator** → secure the local **floodplain permit** for any work in the mapped floodplain. [\(Click Here\)](#)



2. **Call DEP Northcentral (570-327-3636)** → describe the site and ask whether an **Emergency Permit** is appropriate or which **GP** fits (often GP-3/GP-11, sometimes GP-7/GP-8 for access). [\(Click Here\)](#)
3. **Coordinate with TCCD** on GP registration and **E&S/NPDES** needs if you're disturbing soil. [\(Click Here\)](#) & [\(Click Here\)](#)
4. **Check PFBC timing** (trout windows) and request any necessary **time-of-year waiver**. [\(Click Here\)](#) & [\(Click Here\)](#)
5. **PA One Call (811)** before excavation or moving gravel with equipment (3–10 business days). [\(Click Here\)](#)
6. **If the work touches federal project lands or navigable waters** (e.g., near Cowanesque Lake) confirm any **USACE coordination**—in PA, federal 404 coverage is via **PASPGP-6** through the DEP joint process. [\(Click Here\)](#) **If seeking federal recovery funds**, coordinate early with **NRCS EWP/FEMA PA** so permitting and documentation align with funding requirements. [\(Click Here\)](#) & [\(Click Here\)](#)

Miscellaneous Links

- **DEP Emergency Permits** explainer. [\(Click Here\)](#)
- **DEP Flood-damaged bridges/culverts & emergency debris removal** guidance (incl. the 50-ft maintenance zone). [\(Click Here\)](#)
- **Standards for Channel Cleaning at Bridges & Culverts** (PDF). [\(Click Here\)](#)
- **Chapter 105 General Permits** page + **eLibrary** GP forms (incl. **GP-3**). [\(Click Here\)](#) & [\(Click Here\)](#)
- **PASPGP-6** (USACE/DEP joint 404 authorization in PA). [\(Click Here\)](#)
- **PFBC stocked-trout in-stream restriction context / waiver memo**. [\(Click Here\)](#) & [\(Click Here\)](#)
- **NRCS EWP** program overview. [\(Click Here\)](#)
- **FEMA Category A Debris Removal** guidance (coordination with NRCS). [\(Click Here\)](#)
- **DEP Northcentral Regional Office** contact. [\(Click Here\)](#)



- **Tioga County Floodplain Administrators directory.** [\(Click Here\)](#)

**** See matrix below ****

Activity	Permit / Approval Needed	Agency / Contact	Notes / Timing
Remove debris from stream channel (fallen trees, gravel bars, man-made debris)	GP-3 (Bank Rehabilitation, Gravel Bar Removal) OR Emergency Permit if imminent threat	PA DEP – Northcentral Regional Office (570-327-3636); Tioga County Conservation District (TCCD)	Emergency permits can be issued same-day; GP-3 needs registration with TCCD
Repair or replace damaged culverts/bridges	GP-11 (Maintenance, Repair, Replacement); Floodplain Development Permit	PA DEP / TCCD; Municipal Floodplain Administrator	Local floodplain permit must be issued first; coordinate with FEMA PA if seeking funds
Build or use temporary stream crossing (equipment access)	GP-8 (Temporary Road Crossing)	PA DEP / TCCD	Removal required after work is complete
Repair or build permanent small road crossing	GP-7 (Minor Road Crossing)	PA DEP / TCCD	Typically for driveways, small township roads
Channel cleaning at bridge/culvert (within 50 ft upstream/downstream)	Maintenance Activity (no GP if <10% cross-sectional loss)	PA DEP standards (via TCCD)	Must follow DEP 'Standards for Channel Cleaning'
Work within mapped floodplain (any development or repair)	Floodplain Development Permit	Municipal Floodplain Administrator	Required in addition to any DEP GP
Soil disturbance ≥ 5,000 sq ft (staging, road repair, grading)	Erosion & Sediment (E&S) Control Plan	TCCD (Chapter 102 delegation)	Written plan required; approval needed if DEP requests
Soil disturbance ≥ 1 acre	NPDES PAG-02 Permit (Construction Stormwater)	PA DEP / TCCD	Updated PAG-02 issued 2024



In-stream work during trout season (Mar 1–Jun 15)	Time-of-Year Restriction Waiver	PA Fish & Boat Commission (PFBC)	Required if work cannot be delayed
Work on or across USACE-managed lands/waters (e.g., Cowanesque Lake)	Coordination w/ USACE Baltimore District	U.S. Army Corps of Engineers	Covered under PASPGP-6 with DEP but must contact project office
Debris removal/streambank stabilization under federal disaster recovery	NRCS EWP Assistance; FEMA PA Cat A	USDA NRCS; FEMA Region III (via PEMA/County EMA)	Funding tied to permits; coordinate early
Any excavation (access roads, staging areas)	PA One Call (811)	PA One Call System	Call 3–10 business days prior to digging



Section 6

Legislative Outreach

Geospatial Products

GIS DEVELOPMENT & INNOVATIVE COMPUTATIONAL SOLUTIONS

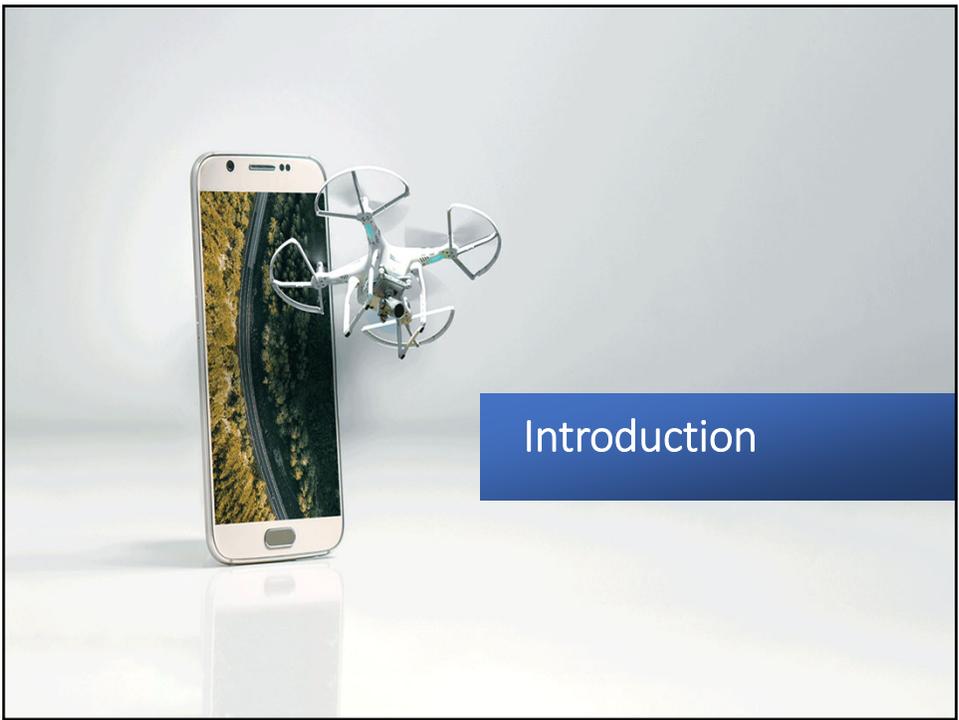
Enhancing Disaster Response



Leveraging Drone Inspection Data for Debris
Removal and Erosion Analysis

Tioga County, PA GIS Department

*Presentation originally developed for the 2025 PA GIS Conference and the 2025 PA Floodplain
Managers Conference.*



Introduction



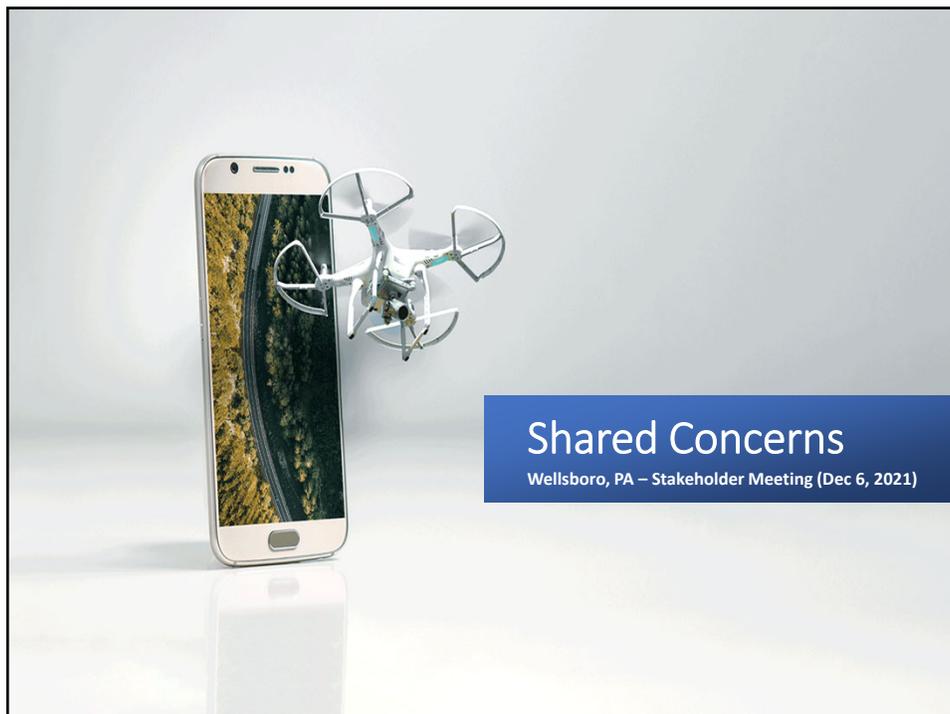
Introduction

- In the wake of **Tropical Storm Debby (August 9, 2024)** Tioga County faced tight deadlines and limited resources while assessing the storm's impact along the Cowanesque River.
- To support **relief funding applications for debris removal and erosion mitigation efforts**, the county utilized a sequential catalog of drone (UAV) flight imagery several separate missions.
- Successfully provided critical visual documentation and basic analysis.

Introduction



- As the project progressed, concepts of Geospatial Artificial Intelligence (GeoAI) were explored to further enhance the data's utility.
 - ✓ Enabling more efficient assessment via both remote and field methods; along with critical decision-making for ongoing debris removal and erosion analysis.
- This presentation evaluates methods, challenges, and potential of integrating drone-based geospatial data and AI-driven insights for disaster recovery efforts.



Background



- **Wellsboro Stakeholder Meeting (Dec 6, 2021)**
- High-Level Discussion: **State Rep. Clint Owlett** hosted a House Policy Committee hearing at the Wellsboro, Pennsylvania Fire Department Annex.
- Local officials, conservation leaders, and landowners gathered to address severe creek and stream erosion issues.
- **Focus on Flooding & Debris:** *The meeting highlighted how gravel bars and debris buildup in Tioga County streams were worsening flood risks.*

Background



Local Leaders, Landowners Tell Lawmakers Streamlined Permitting, Funding Necessary to Protect Against Flooding

Owlett, Causer co-host Policy Committee hearing in Wellsboro
WELLSBORO – Government officials, conservation leaders and area landowners must work together to properly maintain creeks and streams to prevent devastating floods like the ones seen in the region this summer, members of the House Majority Policy Committee heard Monday.

The hearing was co-hosted by Rep. Clint Owlett (R-Tioga/Bradford/Potter) and Policy Committee Chairman Martin Causer (R-Cameron/McKean/Potter) at the Wellsboro Fire Department Annex. It was preceded by a tour to several problem areas, including Knox Road, Grubb Road Bridge, Seeley Street in Knoxville, and RJ Wood Family Farm.

"The extreme flooding we've seen in some of our communities presents a major threat to the lives and livelihoods of our citizens – and in so many cases it's preventable," Owlett said. "We need to be able to properly maintain our creeks and streams, and I'm grateful to members of the Policy Committee for coming to our area to learn more about the problem and work toward potential solutions."



Background



- **Wellsboro Stakeholder Meeting (Dec 6, 2021)**
- Testimony underscored the need for proactive stream maintenance to prevent disasters – clogged streams and erosion were contributing to dangerous floods.
- Lawmakers heard calls for streamlined permits and funding to clear obstructions.
- ✓ ***Tioga County Commissioner Erick Coolidge urged enabling boroughs/townships to act before the next storm strikes.***

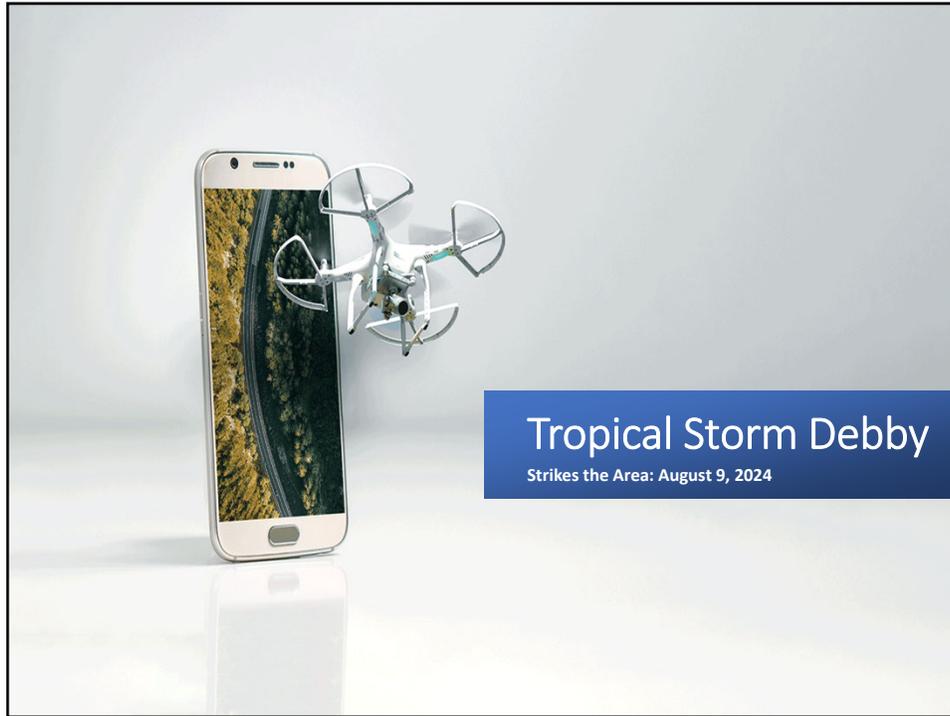
Background



Consensus among municipal officials, state agencies, and landowners was that current regulations made it hard to clear debris like gravel bars from rivers, which worsened flooding.

- ✓ Participants stressed a proactive approach.
- ✓ Stream maintenance and debris removal ahead of storms, rather than reacting afterward.

Meeting set the stage for policy proposals to better manage waterways and reduce erosion damage in places like Tioga County.



The Storm

Nation Weather Service – NOAA Report (Hurricane Center)

NATIONAL HURRICANE CENTER
TROPICAL CYCLONE REPORT

HURRICANE DEBBY
(AL042024)
3–8 August 2024

Brad J. Reinhart, Amanda Reinhart, and Laura Alaka
National Hurricane Center
4 February 2025¹

GOES EAST INFRARED SATELLITE IMAGE OF HURRICANE DEBBY MAKING LANDFALL IN THE BIG BEND REGION OF FLORIDA AT 1805 UTC AUGUST 2024. IMAGE COURTESY NOAA/NOAA/ES&F.

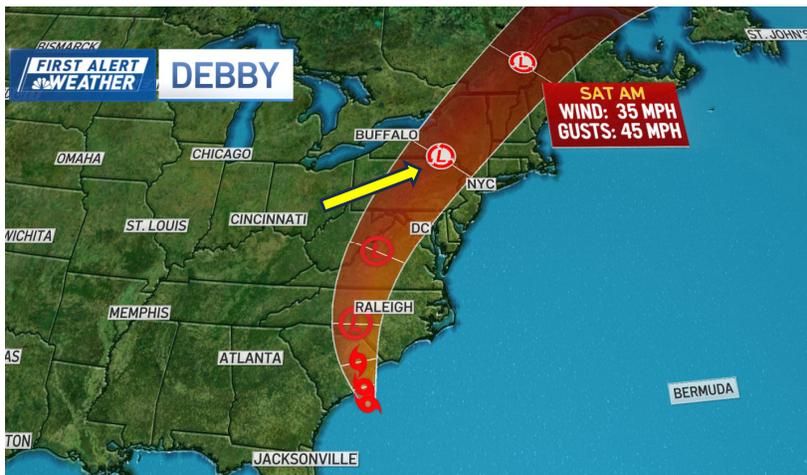
Debby was a category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale) that made landfall along the Florida Big Bend. After emerging over the southwestern Atlantic Ocean, Debby transitioned to a subtropical storm and made a second landfall in South Carolina. Debby produced devastating flash and river flooding impacts across portions of the southeastern United States and was responsible for 18 fatalities (12 direct) and over \$4 billion (USD) in damage in the United States and Canada.

¹ Original report date 23 January 2025. This version includes updates to the tornado section, Figure 12, and the supplemental data file.

The Storm



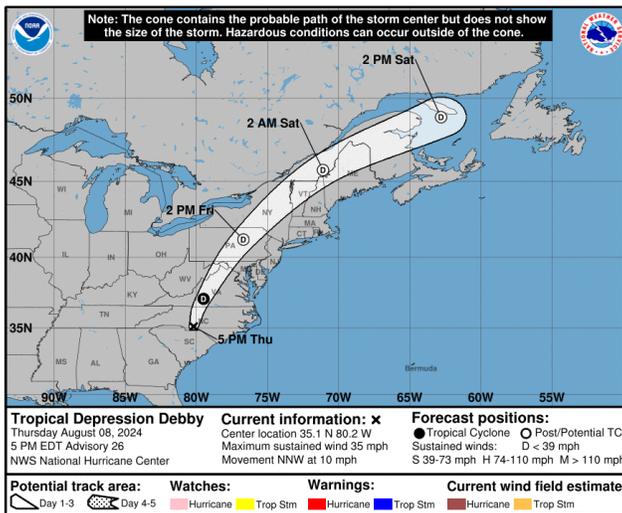
• Nation Weather Service – NOAA Report

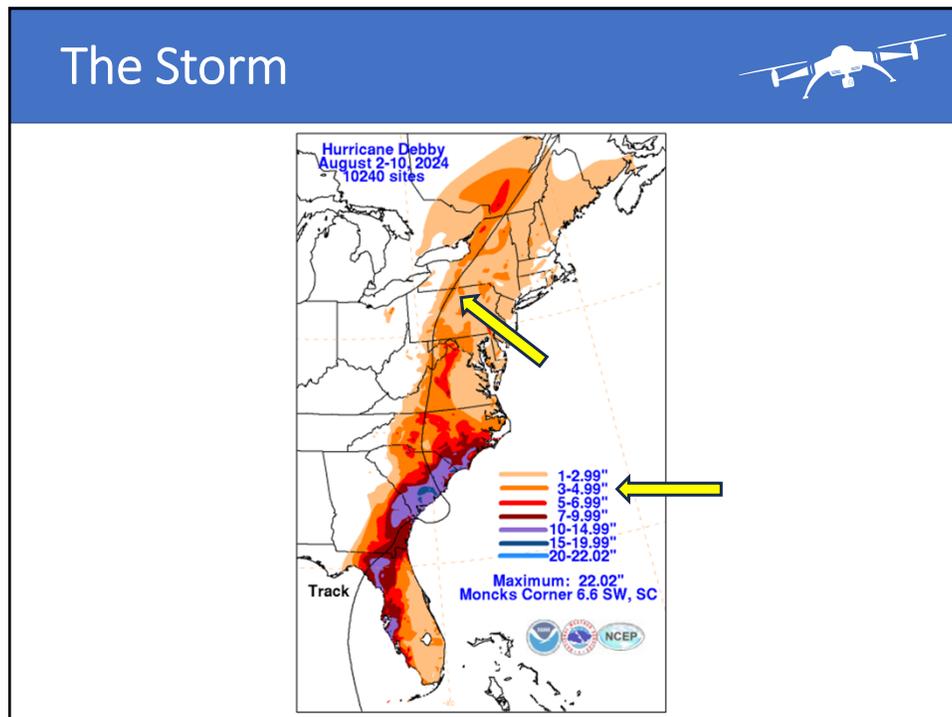


The Storm



• Nation Weather Service – NOAA Report





The Storm

- **Tropical Storm Debby Strikes (August 9, 2024)**
- Record Rainfall: Much of the north-central Pennsylvania region saw 1 to 4 or more inches of rain in under 24 hours.
- Parts of nearby Potter County recorded over 4 inches, triggering flash floods.
- Emergency Response: In Tioga and Potter counties, 911 centers were inundated with calls.
- First responders performed many water rescues.

The Storm



- **Tropical Storm Debby Strikes (August 9, 2024)**
- Cowanesque Valley Flooding:
- The Cowanesque River at Westfield (Tioga County) shattered its record crest – rising to just over 13.5 feet (previous record 11.1 ft from 1996).
- Water quickly overwhelmed roads, swept away cars, and even knocked houses off foundations.
- **One fatality from the flash-flooding.**

The Storm



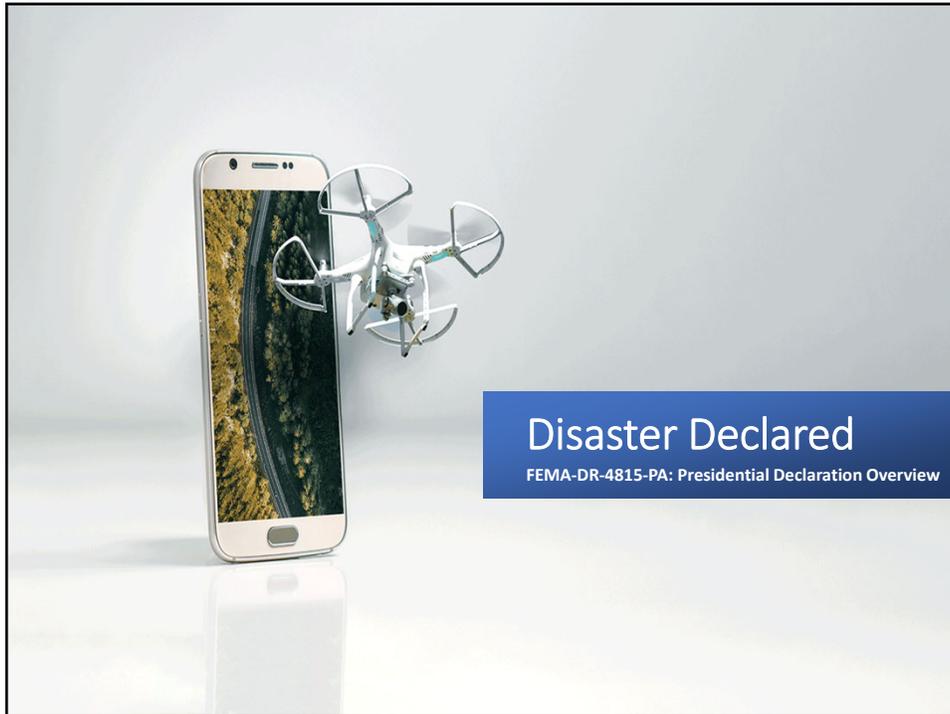
Flooding in Tioga County, PA – August 2024.



The Storm



Flooding in Tioga County, PA – August 2024.



FEMA-DR-4815-PA



- **Federal Aid:** On Sept. 11, 2024, a **Presidential Major Disaster Declaration (FEMA-DR-4815-PA)** was approved for Tropical Storm Debby.
- Tioga, Potter, Lycoming, and Union counties were designated for federal disaster assistance.
- **Individual Assistance:** FEMA's Individual Assistance allowed homeowners and renters in Tioga & neighboring counties could apply for aid to cover uninsured losses, repairs, temporary housing, etc.

FEMA-DR-4815-PA



- **Timeline – Summarizing Federal & State Aid:**
- Governor Josh Shapiro issued a Proclamation of Disaster Emergency for 21 counties on August 9, 2024, later amending it to include 28 counties as further assessments revealed extensive damages.
- By late 2024, FEMA had approved over \$12 million in relief for victims in the four hardest-hit counties.
- Disaster Recovery Coordination Centers were set up in the affected region to assist victims file and track claims.

FEMA-DR-4815-PA



- **Federal Aid:**
- **Mitigation Assistance:** The declaration activated the Hazard Mitigation Grant Program (HMGP), a post-disaster funding mechanism under Section 404 of the Stafford Act.
- HMGP is designed to support long-term, cost-effective mitigation efforts aimed at reducing the impact of future natural disasters.
- Individual Assistance made available to residents in the declared counties – HMGP is available statewide.

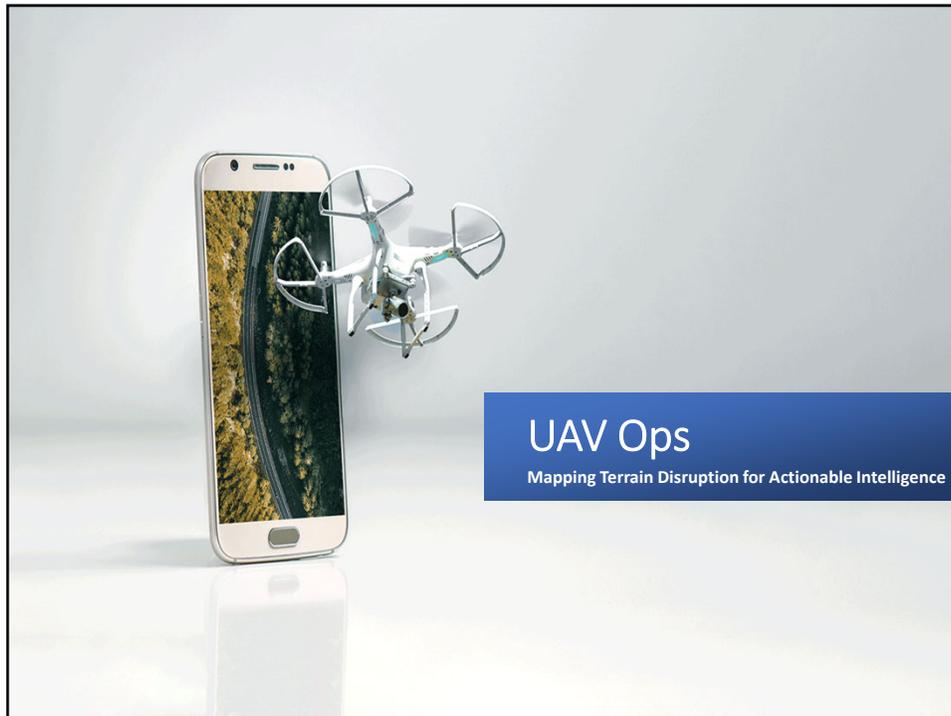
FEMA-DR-4815-PA



Mitigation Assistance

Eligible Mitigation Projects Relevant to our Topic:

- Streambank Stabilization.
- Installation of riprap, gabions, and vegetative buffers to prevent erosion.
- Stormwater Infrastructure Improvements: Enlarging culverts, improving drainage capacity, or rerouting high-risk flows.



UAV Ops



- Public meeting of October 8, 2024: The Tioga County Board of Commissioners approved allocation for damage assessment and debris identification UAV/drone missions.
- Conducted by the North Central Pennsylvania Unmanned Emergency Services (Department 50), aka **Unmanned-50**.
- Subject area for this talk: aerial inspection along the Route 49/Cowanesque River corridor (and select tributaries).
- Also limited missions in the Liberty Borough area.

UAV Ops



- Background: North Central Pennsylvania Unmanned Emergency Services (Department 50), aka **Unmanned-50**.
- Founded in 2021, based in Tioga County, PAA 501(c)(3) non-profit emergency services unit.
- Entirely focused on unmanned systems (drones, ROVs) Volunteer-based, integrated into the 911 dispatch.
- Mission & Motto: “Novus Optios” – “New Options” with the mission of supporting incident commanders using drones for ISR – Bridging the tech gap for rural emergency.

UAV Imagery Missions



Drone-50.com



OUR MISSION IS TO ENHANCE THE SAFETY AND EFFECTIVENESS OF EMERGENCY RESPONSE AND PUBLIC SAFETY OPERATIONS THROUGH UNMANNED SYSTEMS AND ADVANCED TECHNOLOGY.

UAV Imagery Missions



Drone-50.com

"New Options" for Incident Commanders

North Central Pennsylvania Unmanned Emergency Services (Tioga County Department 50) is a 501c3 non-profit emergency services organization that provides direct emergency response and ISR support to Tioga, Potter, and northern Lycoming County Pennsylvania public safety agencies of all disciplines using unmanned and remote (airborne and marine) technology.

We began providing emergency services in 2021 and we are currently the only department in our primary coverage area (2,000+ square miles) that has unmanned capability. Additionally, we are the only recognized stand-alone Unmanned and ISR-Oriented department in the Commonwealth of Pennsylvania.

We support all incident-types, including structure fires, wildland fires, major flooding and water rescues, searches, high-angle rescues, disaster damage assessments, special event support, and law enforcement operations.

Our ranks include FAA certified pilots, paramedics & EMT's, combat veterans, administrative professionals, rescue specialists, and various other disciplines. Unlike a traditional fire or rescue department, we have taken an aviation-oriented approach to our organization-structure, policies, and SOP's due to the regulatory nature of unmanned air and marine systems. This also comes from the lessons-learned from the experiences of our members who have served in combat, aviation, emergency services, and various other roles. This approach ensures a culture of individual and organizational professionalism and accountability, standards and compliance, as well as safety and risk management. It has introduced new options and mutual aid capabilities to every public safety organization in our coverage area.



UAV Ops



- FAA-certified drone pilots and underwater ROV operators.
- Drones equipped with thermal cameras, sensors, and mapping tools.
 - Deployable for:
 - ✓ Structure fires.
 - ✓ Wildfires.
 - ✓ Flood response.
 - ✓ Water rescues.
 - ✓ Missing persons/rope rescues.
 - ✓ Law enforcement reconnaissance.
 - ✓ Damage assessment.

UAV Ops



- **Immediate Aftermath of Storm – Unmanned-50**
- **Rapid Deployment:** Drones launched mid-storm on Aug. 9, 2024, giving incident command real-time aerial visibility while roads were flooded.
- **Search & Rescue Support:** Enabled location of stranded victims during active flood conditions – enhancing responder safety and efficiency.
- **Public Safety Integration:** Operates through 911 dispatch like any fire/rescue unit, deploying UAVs and ROVs for real-time intel.

UAV Ops



- **Immediate Aftermath of Storm – Unmanned-50**
- **8,000+ Geo-Tagged Images:** Captured high-resolution drone imagery across Tioga and Potter Counties within days, including **washed-out bridges, landslides, and debris dams.**
- **Prioritizing Hazards:** Drone maps allowed officials to **target creek blockages, unstable slopes,** and eroded banks for urgent mitigation.

UAV Ops

- **Immediate Aftermath of Storm – Unmanned-50**
- **Equipment Specs**
 - **DJI M3T UAVs** utilized for our most operations and for the flood work completed in August through October of 2024
- **Credit: Ron Warren, Chief 50**
- **North Central Pennsylvania Unmanned Emergency Services (Tioga County Department 50)**

UAV Ops

- **Immediate Aftermath of Storm – Unmanned-50**
 - **DJI M3T UAVs**

Specs

Aircraft

Weight (with propellers, without accessories) ^[1]	DJI Mavic 3E: 915 g DJI Mavic 3T: 920 g
Max Takeoff Weight	DJI Mavic 3E/3T: 1050 g <small>With DJI Mavic 3 Enterprise Series Battery (EU C1 Version) and DJI Mavic 3 Enterprise Series Low-Noise Propellers, the max takeoff weight of DJI Mavic 3T and DJI Mavic 3E is 899 g.</small>
Dimensions	Folded (without propellers): 221×96.3×90.3 mm (L×W×H) Unfolded (without propellers): 347.5×283×107.7 mm (L×W×H)
Diagonal Distance	380.1 mm
Max Ascent Speed	6 m/s (Normal Mode) 8 m/s (Sport Mode)
Max Descent Speed	6 m/s (Normal Mode) 6 m/s (Sport Mode)
Max Flight Speed (at sea level, no wind)	15 m/s (Normal Mode) Forward: 21 m/s, Side: 20 m/s, Backward: 19 m/s (Sport Mode) ^[2]

UAV Ops

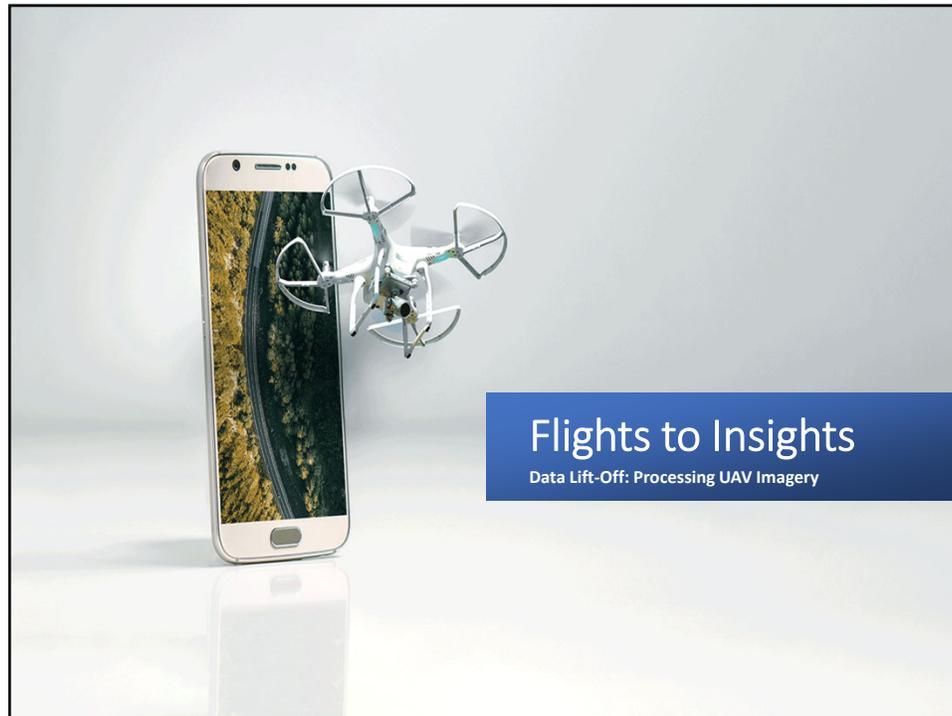
- **Immediate Aftermath of Storm – Unmanned-50**
 - **DJI M3T UAVs**

Wide Camera	
Sensor	DJI Mavic 3E: 4/3 CMOS, Effective pixels: 20 MP DJI Mavic 3T: 1/2-inch CMOS, Effective pixels: 48 MP
Lens	DJI Mavic 3E: FOV: 84° Format Equivalent: 24 mm Aperture: f/2.8-f/11 Focus: 1 m to ∞ DJI Mavic 3T: FOV: 84° Format Equivalent: 24 mm Aperture: f/2.8 Focus: 1 m to ∞
ISO Range	DJI Mavic 3E: 100-6400 DJI Mavic 3T: 100-25600
Shutter Speed	DJI Mavic 3E: Electronic Shutter: 8-1/8000 s Mechanical Shutter: 8-1/2000 s DJI Mavic 3T: Electronic Shutter: 8-1/8000 s
Max Image Size	DJI Mavic 3E: 5280×3956 DJI Mavic 3T: 8000×6000

UAV Ops

- **Immediate Aftermath of Storm – Unmanned-50**
 - **DJI M3T UAVs**

Tele Camera	
Sensor	1/2-inch CMOS, Effective pixels: 12 MP
Lens	FOV: 15° Format Equivalent: 162 mm Aperture: f/4.4 Focus: 3 m to ∞
ISO Range	DJI Mavic 3E: 100-6400 DJI Mavic 3T: 100-25600
Shutter Speed	Electronic Shutter: 8-1/8000 s
Max Image Size	4000×3000
Photo Format	JPEG
Video Format	MP4 (MPEG-4 AVC/H.264)
Still Photography Modes	DJI Mavic 3E: Single: 12 MP Timed: 12 MP JPEG: 0.7/1/2/3/5/7/10/15/20/30/60 s Smart Low-light Shooting: 12 MP DJI Mavic 3T: Single: 12 MP Timed: 12 MP JPEG: 2/3/5/7/10/15/20/30/60 s Smart Low-light Shooting: 12 MP



Flights to Insights



UAV Imagery Integration for Post-Flood Assessment: Tioga County – Cowanesque River & Route 49 Corridor

Fall of 2024 UAV Mission

- 4,316 total UAV images collected
- **2,576** images selected for viewing and analysis

Objective: Rapid assessment of debris and erosion post-flood

💡 ***“We had to act fast to get something usable in front of key stakeholders—this was about speed, clarity, and actionable data.”***

Flights to Insights



GIS Processing Workflow Summary

- Create the entirety of the Flight Path with ESRI's ArcGIS Pro Geoprocessing tools.
- Plotted x/y as vector points to form UAV flight line.
- Images attached to points using built-in attachment tools.

💡 ***“ESRI Desktop came through for us here, ArcGIS Pro provided a straightforward processing workflow with satisfactory results.”***

Flights to Insights



Extracting Value from Metadata

- **Situational Overview Imagery**: broad overview shots or to assess the overall scene. Large areas shown with moderate detail.
- Each image contained x/y coordinate metadata.
- Coordinates represent drone location (camera angle origin). Enabled accurate spatial plotting of images.

💡 ***“Rather than reinvent the wheel, we let the image metadata guide us—every image already knew where it came from.”***

Flights to Insights



Publishing and Sharing Results as Web Services

- Hosted the vector/image layer as a web service on ArcGIS Online.
- Integrated with Tioga County's modular GIS web layers.
- Enabled easy stakeholder access.

💡 *"This wasn't just a one-off—it became part of our broader web GIS ecosystem."*

Flights to Insights



Choosing the Right Web Application

- Tested: Web App Builder, Experience Builder, & Others.
- Time of the essence. Final Choice: **Attachment Viewer**.
- Sequential display of UAV images along flight path.
- Very focused user experience.

💡 *"In a sea of powerful tools, this one turned out to be the best, especially considering user feedback."*

Flights to Insights



The Final Result of this Phase

- Erosion, debris, and damage visualized.
- Clean, interactive image viewer for stakeholders
- Clear depiction of short-term and long-term impacts on the riverway
- **Shared with:**
 - ✓ County Personnel.
 - ✓ DES Staff in particular.
 - ✓ PEMA Decision Makers.

💡 ***“The imagery spoke volumes. What might’ve taken pages of explanation became instantly clear with a single click.”***

Flights to Insights



Praise from Representative Owlett’s Office.

Acknowledgment for Key stakeholders.



OWLETT & CAUSER CO-HOST POLICY COMMITTEE HEARING TO DISCUSS STREAM MAINTENANCE & FLOODING

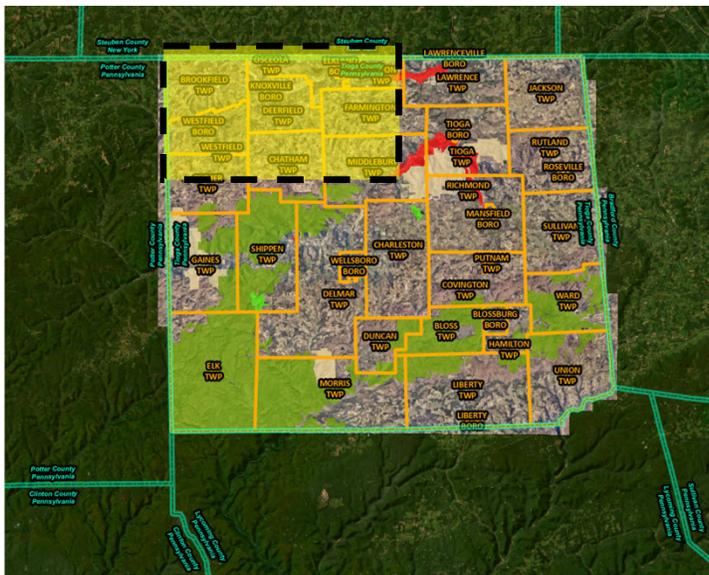
by Andrew Moore - December 9, 2021

💡 ***“The imagery spoke volumes. What might’ve taken pages of explanation were instantly clear with a single click.”***

Flights to Insights



Flight Area



Flights to Insights



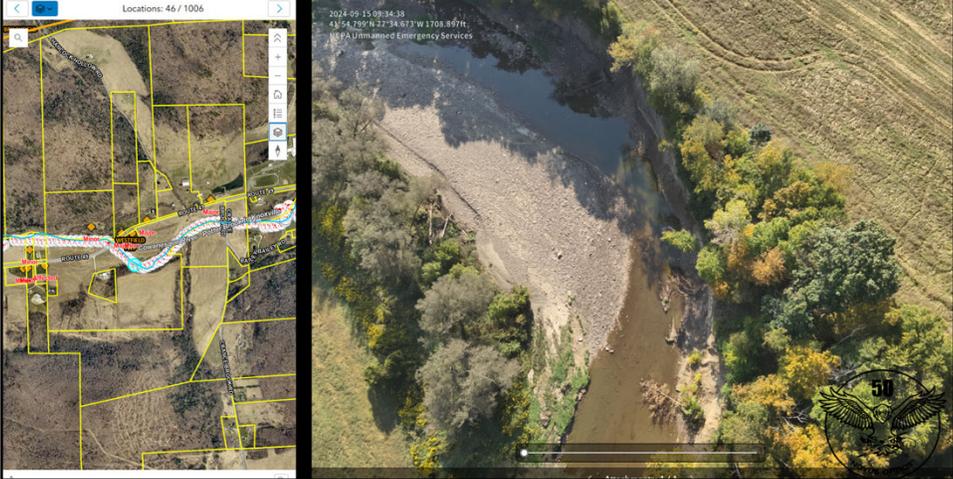
Flight Area



Flights to Insights



Flight Area



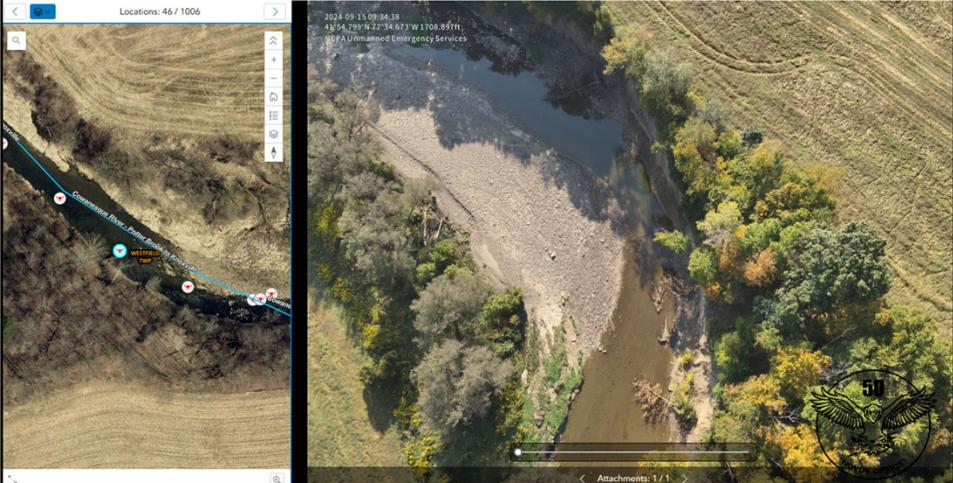
Locations: 46 / 1006

2024-09-15 09:34:38
43°54'29"N 21°34'07"W 1708.89ft
ATA Ultimate Emergency Services

Flights to Insights



Flight Area



Locations: 46 / 1006

2024-09-15 09:34:38
43°54'29"N 21°34'07"W 1708.89ft
ATA Ultimate Emergency Services

Attachments: 1 / 1

Flights to Insights



Pre-built GIS web services, always a major asset!



Flights to Insights



Broad area sweeps – maximizing situational overviews!



Flights to Insights



Broad area sweeps – maximizing situational overviews!



The image displays a side-by-side comparison of drone flight data. On the left is a map interface with a 60% zoom level, showing a flight path with red arrows and various location markers. On the right is a live aerial view of a rural landscape with fields, trees, and buildings, with a red arrow pointing to a specific structure. A circular logo with the number '50' and an eagle is visible in the bottom right corner of the aerial view.

Flights to Insights



Behind the supermarket/gas station. Area of attention.



The image displays a side-by-side comparison of drone flight data. On the left is a map interface with a 60% zoom level, showing a flight path with red arrows and various location markers. On the right is a live aerial view of a wooded area with a clearing, with a red arrow pointing to a specific spot. A circular logo with the number '50' and an eagle is visible in the bottom right corner of the aerial view.

Flights to Insights

Parcel/ownership labels integrated with UAV/Ortho images.



Flights to Insights

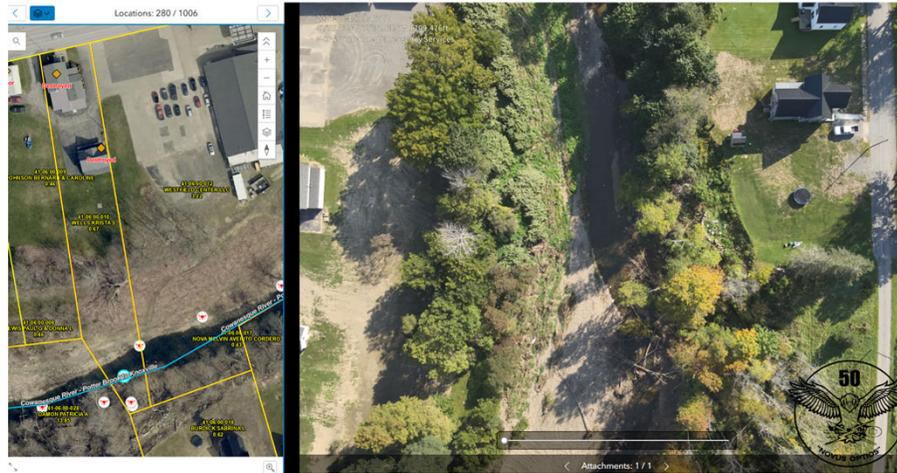
Flooding in Westfield Borough, PA – August 2024.



Flights to Insights



Behind the supermarket/gas station. Area of attention.



Flights to Insights



In-house damage assessment points included.



Flights to Insights



Aerial photo catalogs – historic to present (2015 Catalog).

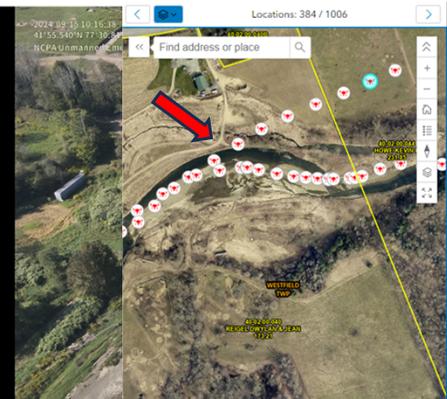
UAV Flights Cowanesque Valley - September 2024



Flights to Insights



Comparison

2015	2024
<p>UAV Flights Cowanesque Valley - September 2024</p> 	<p>UAV Flights Cowanesque Valley - September 2024</p> 





GeoAI Solutions



GeoAI: Geospatial Artificial Intelligence.

What is it?

GeoAI: The integration of geospatial data science with artificial intelligence (AI), especially machine learning (ML) and deep learning (DL), to solve spatial problems.

Remote Sensing: Imagery and sensors:

AI/ML: Automated learning from data, creating new models.

Handbook of Artificial Intelligence (2024) by Gao, Hu, and Li.

GeoAI Solutions



GeoAI: Geospatial Artificial Intelligence.

So, how can we use GeoAI to enhance our results? Ideas?

1. Pictures only geotagged, so how can I still get detailed geospatial information about the images?
2. Consistently identify and classify pixels in the vast catalog of images.
3. Quantify the data in the image. Percentage of pixels are water, trees, debris, etc.

GeoAI Solutions



GeoAI: Geospatial Artificial Intelligence.

So, how can we use GeoAI to enhance our results? Ideas?

1. Geo-reference UAV images with reasonable accuracy (or find a way to use geotagged images).
2. ***Use a trained model to identify different types of erosion and debris from vast amounts of consistently collected imagery.***
3. Getting a volume calculation for certain features shown on the image (3D Solution).

GeoAI Solutions



GeoAI: Geospatial Artificial Intelligence.

GeoAI workflows and tools to consider:

1. Scene-Level Classification & Tagging
2. *Object Detection / Semantic Segmentation*
3. Probabilistic Geo-registration Using AI
4. *3D Reconstruction & AI-Based Feature Recognition*

GeoAI Solutions



GeoAI: Geospatial Artificial Intelligence.

So, how can we use GeoAI to enhance our results? Ideas?

5. *Change Detection Over Time*
6. GeoAI-Enhanced Index Calculation
7. Embedding into GIS Workflows with AI-Driven Insights
8. Federated or Edge-Based AI

GeoAI Solutions



GeoAI workflows

Object Detection / Semantic Segmentation

Objective: Identify and extract specific features (e.g., roads, buildings, vegetation, flooding) from within each UAV image using AI.

Expanded Description:

This workflow involves training AI models to locate and classify individual objects or land cover types within each UAV image.

GeoAI Solutions



GeoAI Workflows

Object Detection / Semantic Segmentation

- Training can be done using manually ***labeled*** UAV images or transfer learning from existing datasets.
- ✓ Output formats include shapefiles (vectors) or classified rasters that can be imported directly into a GIS environment, such as ArcGIS Pro and then published as a shared service, etc.

GeoAI Solutions



GeoAI Workflows

Object Detection / Semantic Segmentation

- Tools like ArcGIS Pro's **“Train Deep Learning Model”** and **“Detect Objects Using Deep Learning”** can help create an end-to-end workflow.
- Ideal method for creating up-to-date maps of damaged infrastructure, invasive species, flood extents, or post-disaster debris.

GeoAI Solutions



GeoAI Workflows

1. Get imagery in a format that can be used.

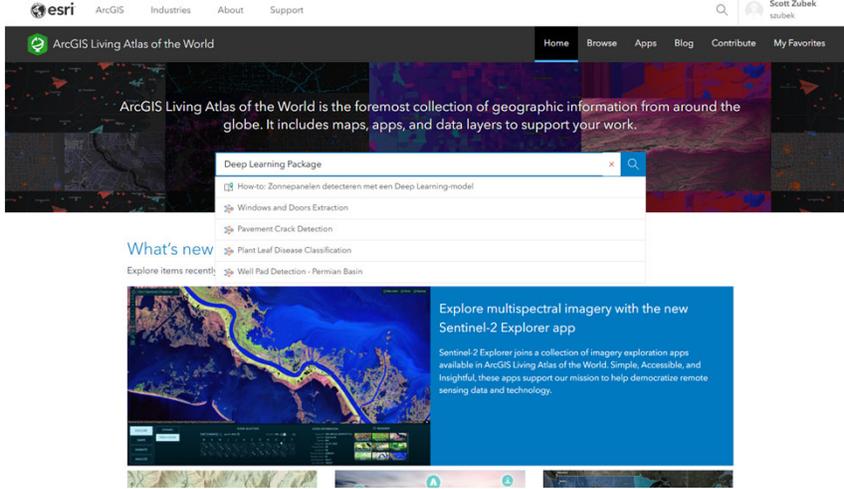


GeoAI Solutions



GeoAI Workflows

2. Study ESRI Living Atlas Deep Learning Packages (DLPKs)



The screenshot shows the ESRI Living Atlas of the World interface. A search bar is open with the query 'Deep Learning Package'. The search results list several items: 'How-to: Zonnepanelen detecteren met een Deep Learning-model', 'Windows and Doors Extraction', and 'Pavement Crack Detection'. Below the search results, the 'What's new' section highlights the 'Sentinel-2 Explorer app', describing it as a collection of imagery exploration apps available in the Living Atlas of the World.

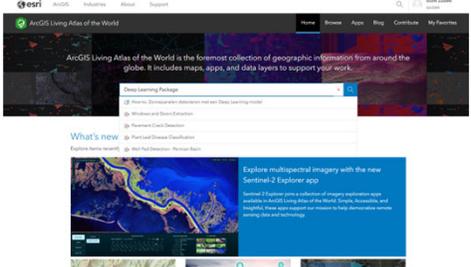
GeoAI Solutions



GeoAI Workflows

Study ESRI Living Atlas Deep Learning Packages (DLPKs)

Explore available pretrained models to understand what's already been developed (e.g., building footprints, tree canopy, land cover). Review the model types, label schemas, and input requirements.



This slide is identical to the one above, featuring the same header, title, and screenshot of the ESRI Living Atlas of the World website. It provides a textual overview of the workflow: exploring pretrained models for tasks like building footprint detection, tree canopy analysis, and land cover classification, and reviewing their specific model types, label schemas, and input requirements.

GeoAI Solutions



GeoAI Workflows

Want to find elephants in the Safari? There's a DLPK for that...

- Deep Learning Package By esri_analytics**
Deep learning model to delineate agricultural fields using Sentinel-2 imagery.
- Deep Learning Package By esri_analytics**
Deep learning model to detect elephants using aerial imagery. *(Highlighted with a red arrow)*
- Prithvi - Flood Segmentation**
Deep learning model to classify flood inundated areas in multispectral satellite imagery.
- Prithvi - E**
Deep learning model to detect and segment trees in high-resolution imagery.
- Insulator**
Deep learning model to detect and segment insulators in high-resolution imagery.

GeoAI Solutions



GeoAI Workflows

Damage Assessment and SAM DLPK.

All content types | All time | All regions | Esri-only content | Authoritative-only content | Sort by: Relevance | 5 Results

- Text SAM**
Deep Learning Package By esri_analytics
Vision language model to detect objects using text prompts. *(Highlighted with a red arrow)*
- Segment Anything Model (SAM)**
Deep Learning Package By esri_analytics
Meta's Segment Anything Model (SAM) for segmenting objects in any imagery. *(Highlighted with a red arrow)*
- Damage Assessment (Drone Imagery)**
Deep Learning Package By esri_analytics
Deep learning model to perform damage assessment on drone and aerial imagery. *(Highlighted with a red arrow)*
- Pool Segmentation - USA**
Deep Learning Package By esri_analytics
Deep learning model to detect and segment swimming pools in high-resolution aerial or satellite imagery.
- Tree Segmentation**
Deep Learning Package By esri_analytics
Deep learning model to detect and segment trees in high-resolution imagery.

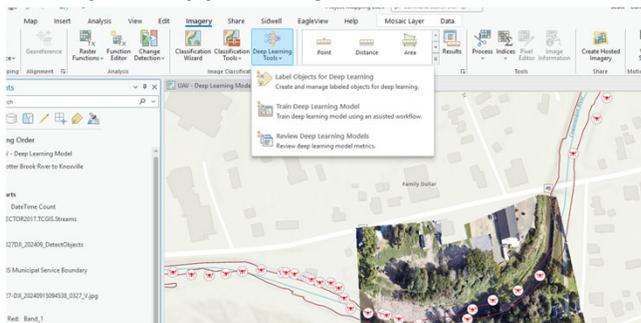
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GeoAI Workflows

Use ESRI's Deep Learning Tools to Prepare Your Data

Set up your imagery environment in ArcGIS Pro or ArcGIS Enterprise. Ensure you have georeferenced imagery or a mosaic dataset ready to support object detection or classification.



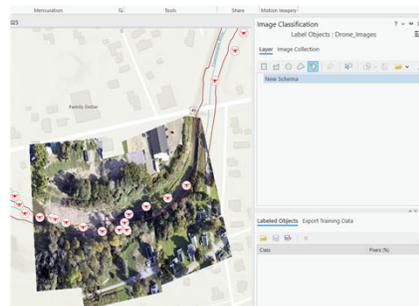
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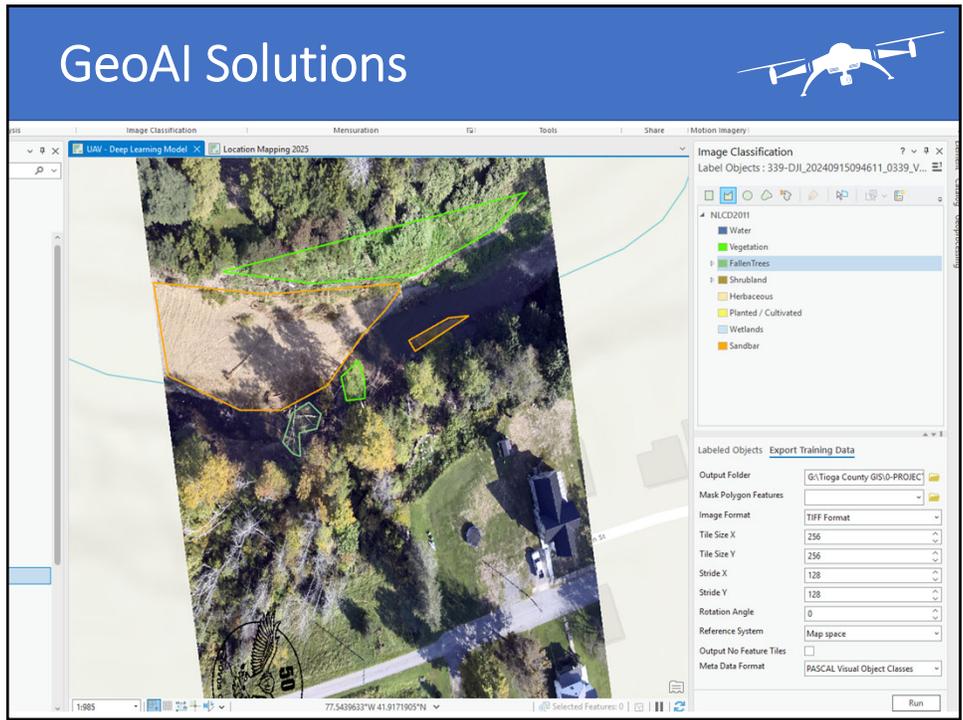
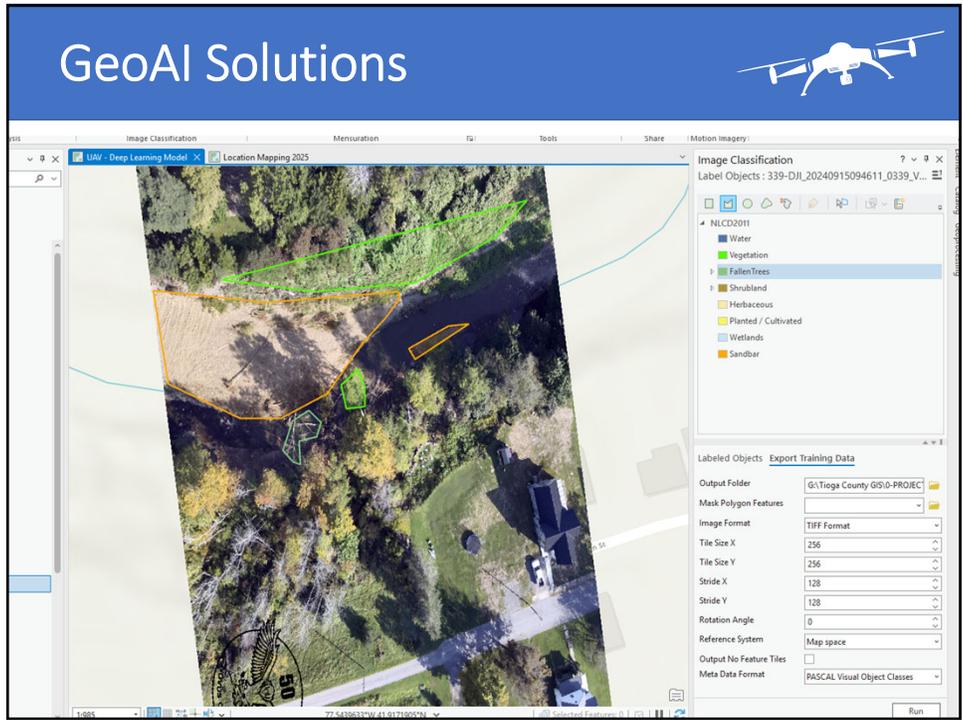


GeoAI Workflows

Label Objects in Your Imagery for Model Training

Use the Label Objects for Deep Learning or Training Samples Manager tool to digitize features of interest (e.g., buildings, debris, water). This forms the foundation of your custom training dataset.





GeoAI Solutions

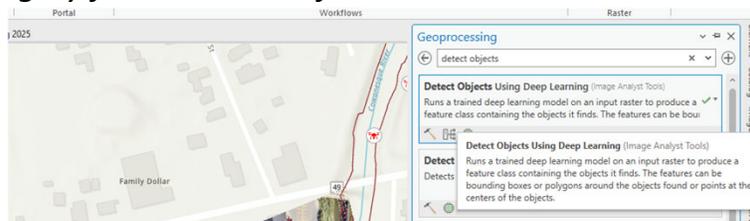


GeoAI Workflows

Use Geoprocessing Tools to Apply the Model at Scale

Apply the model to your imagery using tools like:

- ✓ **Detect Objects Using Deep Learning**
- ✓ **Classify Pixels Using Deep Learning.** *This enables you to run inference on large volumes of UAV, satellite, or aerial imagery for automated feature extraction.*



GeoAI Solutions



GeoAI Workflows

First execution with the trained model didn't pick up nearly enough, hard to classify...

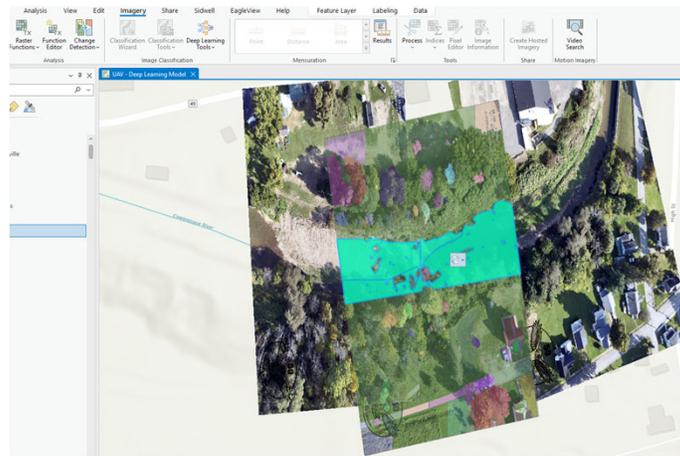


GeoAI Solutions



GeoAI Workflows

Continuing to train the SAM and other models, establishing a workflow and quantifiable results. (Recent Updates)

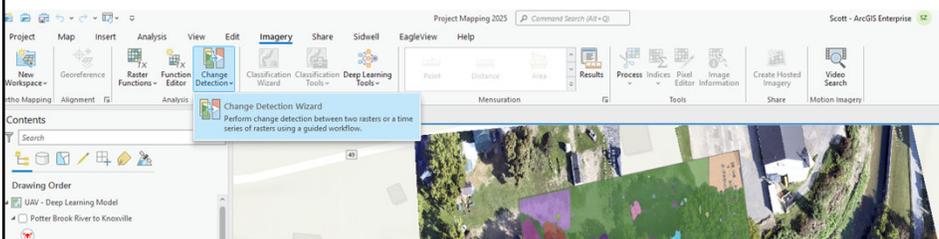


GeoAI Solutions



GeoAI Workflows: Updated data and workflows.

- Utilize new 2025 orthorectified imagery in the processes.
- Change detection: Updated data and workflows.



GeoAI Solutions



Recent Updates as of 4/16/2025

1. Hazard Mitigation Grant Program Letters of Intent Submitted for erosion mitigation and debris removal.
2. Forwarded for processing, i.e. accepted for consideration.
3. Tioga County ortho flights for spring 2025 near completion and in processing.
4. ***Awaiting delivery of the 2025 orthros (Spring/leaf off) with high hopes that debris piles will be noticeable.***

GeoAI Solutions



PA Emergency Management Agency (PEMA)
Letter of Intent (LOI)

SUBJECT: Hazard Mitigation Assistance (HMA) Letter of Intent
TO: State Hazard Mitigation Officer (SHMO)
Pennsylvania Emergency Management Agency
1310 Elmerton Avenue
Harrisburg, PA 17110

Dear SHMO:
The purpose of this notice is to inform you of our interest in participating in the Hazard Mitigation Assistance program(s): Hazard Mitigation Grant Program (HMGP)

Mark L. Bell

Signature Title Deputy Director of EMA

DATE: 04/16/2025
APPLICANT COMMUNITY: Tioga County
COUNTY: Tioga

PROJECT CONTACT

NAME: Mark Brubaker
TITLE: Deputy Director of EMA
AGENCY: Department of Emergency Services
ADDRESS: 90 William Foyel Drive
UEI: UH993C9F13
PHONE: 717-724-4107
E-Mail: markbrubaker@pa.gov

TYPE OF ORGANIZATION

Municipal Government Private Nonprofit
County Government State Agency

LOCATION OF PROJECT: Chautauque, Conowingo/Pine and Shickler, Pine Creek and Shickler, Tioga River and tributaries, and Shickler Creek and tributaries.

BRIEF DESCRIPTION OF PROJECT: Normal operations for floodplain and non-point runoff reduction, tree, stream, bank, project, etc.

BRIEF DESCRIPTION OF PROBLEM TO BE SOLVED: Disruption of water mitigation for risk reduction from debris, debris piles, debris, erosion, and debris from trees, buildings, structures. Debris clean up also alleviates risk to recreational users from hidden objects in the streams and on the streambanks.

TOTAL ESTIMATED COST: 100,000.00

SOURCE OF FUNDING FOR NON-FEDERAL SHARE: Local contribution
Email completed form to: pa-hazmitoff@pa.gov
FAX to PEMA at **717-651-2150** or mail to:

PA Emergency Management Agency
State Hazard Mitigation Officer
1310 Elmerton Avenue
Harrisburg, Pennsylvania 17110

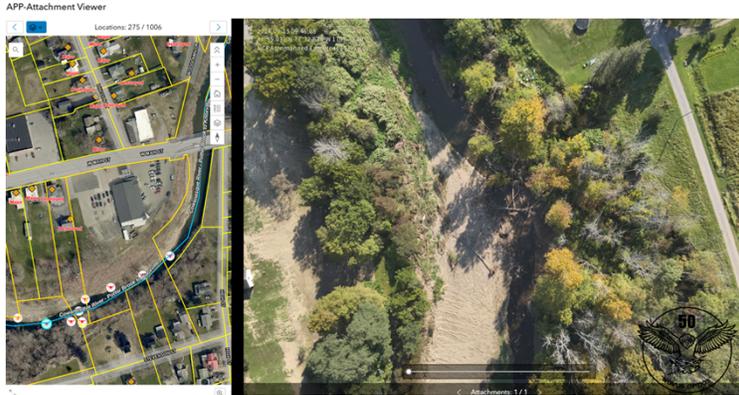
PRE-APPLICATION MUST BE SUBMITTED BEFORE AN APPLICATION PACKET WILL BE SENT TO YOU.

GeoAI Solutions



Recent Updates as of 4/16/2025

- The above detailed attachment viewer will be relied upon heavily to pick out debris areas. These photos will still be very valuable.

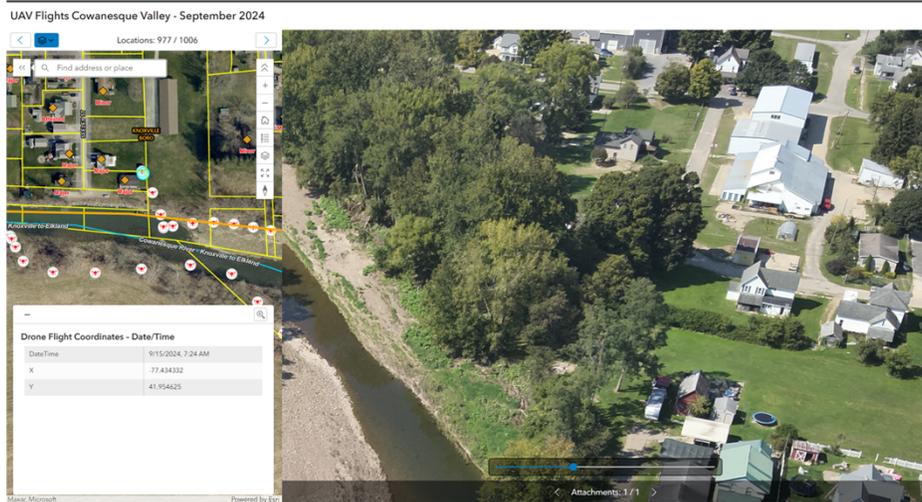


GeoAI Solutions



Recent Updates as of 4/16/2025

- Knoxville Boro requested images of the WTP recently.

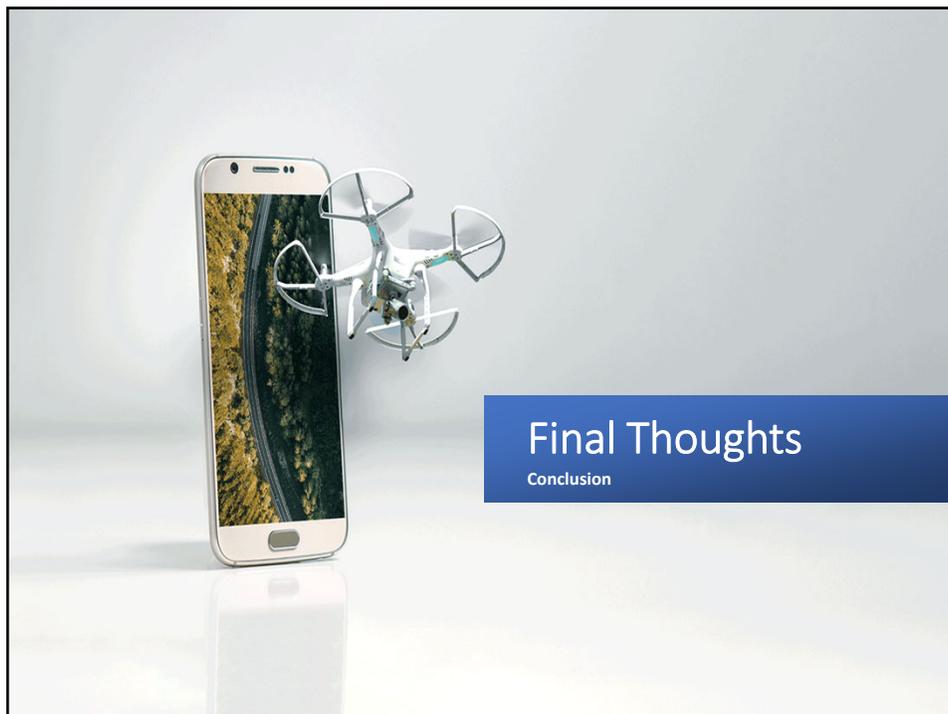


GeoAI Solutions



Recent Updates as of 4/16/2025

1. 2025 Images deliverable **orthorectified**. This is **key** for executing the segmentation AI models, object training and detection, etc.
2. We will attempt to use the AI model workflow outlined prior for **object detection** and **change detection**.
3. **Ultimately, we would like to utilize 3D methods for accurate area & volume calculations. Stay tuned.**

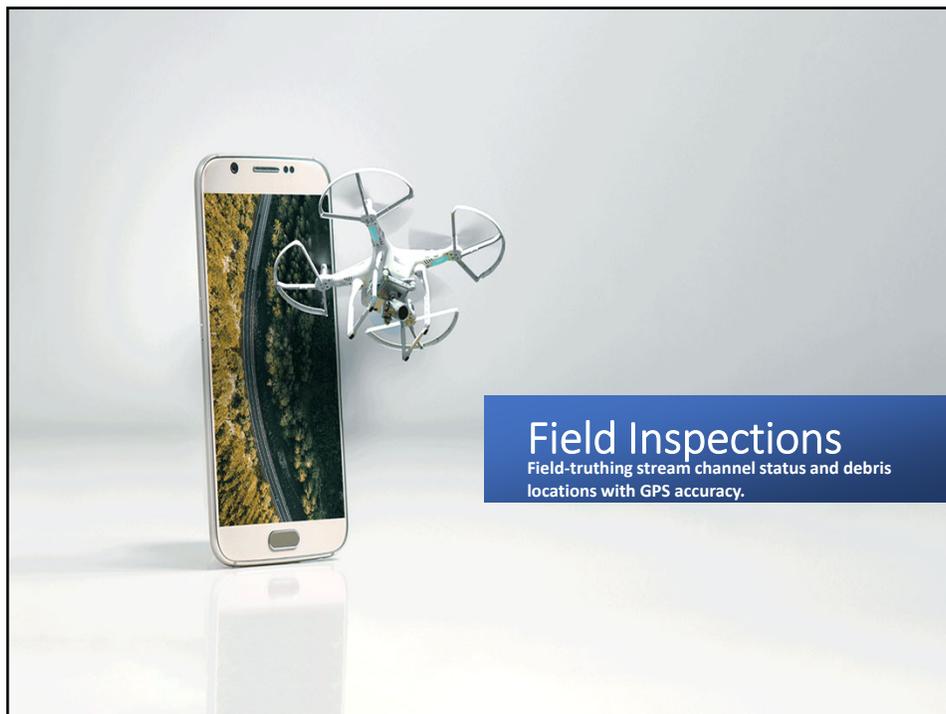


GeoAI Solutions



Some things to keep in mind...

1. In working with imagery data, you will almost assuredly need ESRI extensions such as Image Analyst and Spatial Analyst. *Check your license availability.*
Use ESRI World Atlas > DLPK packages as templates > train those models.
3. Georeferenced/orthorectified data is key. ***Disaster Response Programs (DRPs) in the wake of a disaster may become more valuable than ever because of. Leveraging value...***
4. Workflow has ***quirks and bugs...*** evolving technology. Work with ESRI.
5. Memory issues – consider CPU versus GPU processing options.



Field Inspections



- **Tioga County Commissioners asked the Mitigation Advisory Committee (MAC) – sanctioned by the County’s All-Hazard Mitigation Plan to form a Task Force.**
- **Come up with a system to identify sites along the river for funding and mitigation through channel stabilization.**
- **Draft a legislative master document so that legislators, funding decision makers, local officials, and concerned citizens could track project locations and mitigation progress.**

Field Inspections



Tioga County Mitigation Advisory Committee
 Mission: Regularly assemble members of various governmental and nongovernmental agencies whose respective skills contribute to the implementation of both immediate and long-term based mitigation strategies for Tioga County, Pennsylvania.

MAC

99 William Farrell Drive
 Wellsboro, PA 16901

Scott Zubeck, GRP / MGIS
 (Chairperson)
 Phone: (570) 723-8253
 Email: szubeck@tiogacountypa.us

MAC Meeting Agenda: (Monday) June 30, 2025 – Starting @ 11:00am
Special Session – Stream Bank Stabilization (5-7 Year Plan)

Meeting #2

Agenda – Action Items Review

- Develop a comprehensive 5-year stream maintenance plan aimed at mitigating flood risks, improving streambank stability, and enhancing long-term watershed resilience.
- Emphasis was placed on prioritizing high-risk and high-impact areas along the Cowanesque River (not a creek), Troops Creek, and Potter Brook—areas significantly affected by past flood events and erosion.
- Begin assessments at the Harrison Township boundary along the Potter-Tioga County line and move eastward, systematically evaluating and prioritizing intervention sites along each waterway.
 - High-order Goals**
 - Identifying immediate and long-term maintenance needs
 - Mapping and documenting stream conditions
 - Coordinating debris removal and stabilization efforts
 - Establishing a phased project timeline with achievable milestones
 - Pursuing sustainable funding sources and leveraging interagency support
- **Representative Owlett:**
 - The need for a long-term, phased roadmap with specific projects and timeframes.
 - A public-facing product that shows the community tangible progress and intent.
 - **Strategic funding pursuit, drawing on models from PennDOT and Fish & Boat Commission along with practical aids such as mapping tools and imagery products.**
 - Coordinating local leadership with state-level advocacy for permits and resources.
- **Rep. Owlett had previously suggested using PennDOT’s project planning model as a framework, providing a visual map and timeline of planned projects to the public and stakeholders. (Scott Zubeck)**

Field Inspections



- **Previous attempts at collecting necessary data for funding applications were problematic.**
- **Sites needed to be tied to specific location with approximate classifications and calculations of area and volume – *mismatches*.**



There is also another large gravel deposit approximately 50' upstream of the existing culvert that carries SR 349 over Watties Run. The sediment has the potential to be further washed downstream and into the structure, causing the hydraulic opening of the structure to become smaller; therefore, decreasing the volume of water that the structure could pass without overtopping and increasing the chances of flooding. There is also a gravel deposit located and a small accumulation of tree debris downstream of the structure. The purpose of the project is to remove approximately 2750 cubic yards of sediment and 80 cubic yards of woody material from the site as well as provide approximately 60 cubic yards of rock protection for the upstream stream bank that has become unstable. Access for the upstream removal would be from the private drive that is near the unstable streambank and the downstream access would be through an existing field access adjacent to the sediment build up. The total anticipated area of disturbance for this site is 41,600 SF (0.96 acres).

Field Inspections



- **In July of 2025, two teams performed two-days of field work with mapping/inspection grade GPS equipment hardware, paired with antennas and the ArcGIS Online platform.**
- **Simple, cost-effective, and accurate system using equipment and platforms that we already were using.**

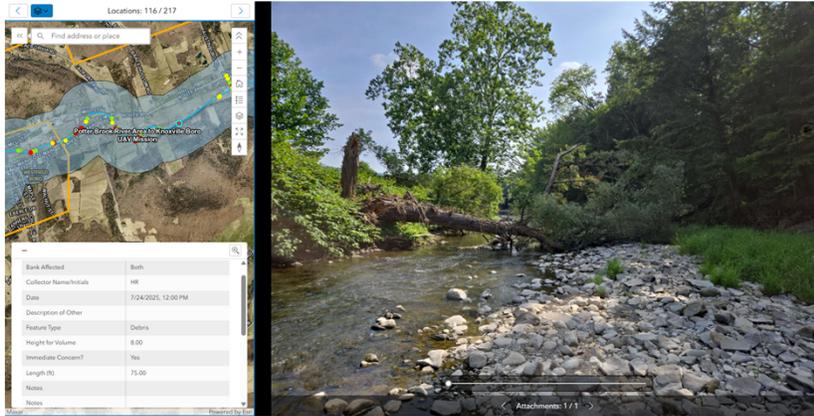


Field Inspections



- **Integrated field-captured points (about 3 meters steady accuracy) with PICTURES along with basic info entered into survey (ESRI's Survey 123).**

UAV Flights Cowanesque Valley - September 2024



The screenshot shows the Survey 123 interface. On the left is a map with a blue highlighted area and a data table. On the right is a photo of a river with a fallen log.

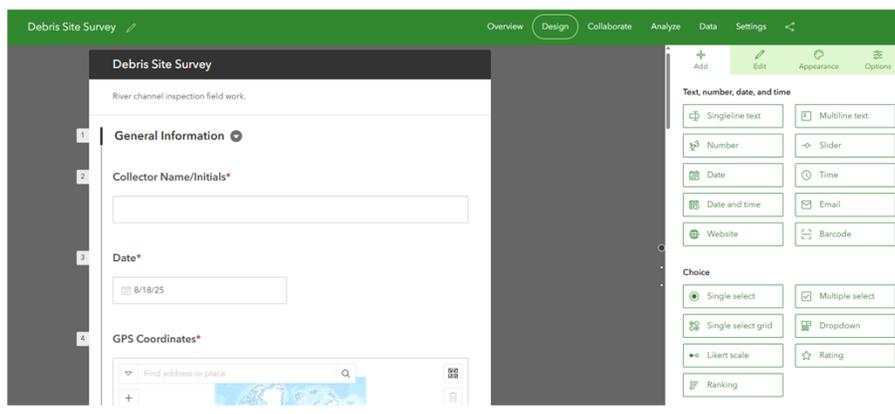
Bank Affected	Both
Collector Name/Initials	MB
Date	7/24/2023, 12:00 PM
Description of Other	
Feature Type	Debris
Height for Volume	8.00
Immediate Concern?	Yes
Length (ft)	75.00
Notes	

Field Inspections



- **Integrated field-captured points (about 3 meters steady accuracy) with PICTURES along with basic info entered into survey (ESRI's Survey 123).**

ArcGIS Survey123 - My surveys



The screenshot shows the Survey 123 form for 'Debris Site Survey'. The form has a green header with 'Overview', 'Design', 'Collaborate', 'Analyze', 'Data', and 'Settings' tabs. The form fields are:

- 1. General Information
- 2. Collector Name/Initials*
- 3. Date*
- 4. GPS Coordinates*

On the right side, there is a 'Text, number, date, and time' section with options: Singleline text, Multiline text, Number, Slider, Date, Time, Date and time, Email, Website, and Barcode. Below that is a 'Choice' section with options: Single select, Multiple select, Single select grid, Dropdown, Likert scale, Rating, and Ranking.

Field Inspections



- Drone shots and field-work all in one web based app.

UAV Flights Cowanesque Valley - September 2024

Locations: 116 / 217

Find address or place

Bank Affected: Both
 Collector Name/Initials: HR
 Date: 7/24/2025, 12:00 PM
 Description of Other:
 Feature Type: Debris
 Height for Volume: 8.00



Field Inspections



- Process the field-work points data, create tabular data for funding applications. 217 locations processed.

MapID	Project	Feature Type	Municipality	Latitude	Longitude	Site/Feature ID	Severity	Length (ft)	Width (ft)	Height for Volume (ft)	Cubic Yards	Bank Affected
1	Debris Management	Debris	WESTFIELD TWP	41.920444	-77.520954		Moderate	50	20	12	444.44	Right
2	Infrastructure Protection	Gravel Bar	WESTFIELD TWP	41.919384	-77.601162	Rocks/gravel bar	Moderate	50	12	1	22.22	Right
3	Bank Stabilization	Undercut Bank	WESTFIELD TWP	41.924841	-77.527971		High	40	6	6	53.33	
4	Debris Management	Infrastructure Risk	WESTFIELD TWP	41.919283	-77.607325		Moderate	10	4	6	8.89	N/A
5	Bank Stabilization	Undercut Bank	WESTFIELD TWP	41.924785	-77.527152		High	60	2	8	65.56	Right
6	Infrastructure Protection	Vegetation Encroachment	WESTFIELD TWP	41.912966	-77.591970	Near bridge	Moderate	100	10	1.5	55.56	Right
7	Bank Stabilization	Erosion	WESTFIELD TWP	41.925662	-77.520284	Under Bank Erosion	Moderate	200	5	8	296.30	Right
8	Debris Management	Debris	WESTFIELD TWP	41.924389	-77.527833	Tree and roots	Moderate	40	10	10	148.15	Left
9	Debris Management	Debris	WESTFIELD TWP	41.924206	-77.520264		Moderate	10	5	3	5.56	
10	Bank Stabilization	Undercut Bank	WESTFIELD TWP	41.920204	-77.529141		High	115	5	3	97.22	Right
11	Debris Management	Gravel Bar	WESTFIELD TWP	41.914423	-77.517481		High	50	20	1	37.04	N/A
12	Bank Stabilization	Erosion	WESTFIELD TWP	41.922003	-77.529840		Moderate	300	20	9	2,000.00	Right
13	Debris Management	Gravel Bar	WESTFIELD TWP	41.914517	-77.517800	Under bridge	High/Critical	155	30	2.5	430.56	Both
14	Debris Management	Debris	WESTFIELD BORO	41.922934	-77.531781	Tree in water root as well	High	20	20	25	370.37	Left
15	Debris Management	Debris	WESTFIELD TWP	41.914678	-77.519904	Tree stump bridge	Moderate	7	7	4	7.26	Both
16	Bank Stabilization	Undercut Bank	WESTFIELD TWP	41.914601	-77.580840	Undercutting pipe	Moderate	400	5	10	740.74	Left
17	Bank Stabilization	Erosion	WESTFIELD BORO	41.922996	-77.532029		Moderate	150	10	15	833.33	Left
18	Debris Management	Gravel Bar	WESTFIELD BORO	41.921946	-77.534979		Moderate	75	60	1	166.67	
19	Bank Stabilization	Erosion	WESTFIELD BORO	41.921778	-77.536604		Moderate	100	20	15	1,111.11	Right
20	Infrastructure Protection	Infrastructure Risk	WESTFIELD BORO	41.921722	-77.535836	Exposed 12" steel pipe	High	40	2	2	5.83	Left
21	Debris Management	Debris	WESTFIELD BORO	41.921987	-77.537517		Low	4	0.3	0.3	0.10	
22	Debris Management	Debris	WESTFIELD BORO	41.921943	-77.537770		Low	2	0.5	0.5	0.02	
23	Bank Stabilization	Erosion	WESTFIELD BORO	41.921956	-77.538018		Low	700	20	10	5,185.19	Left
24	Debris Management	Debris	WESTFIELD TWP	41.912429	-77.596340	Large debris erosion issues.	High	500	12	4	888.89	Both
25	Debris Management	Debris	WESTFIELD BORO	41.917316	-77.543829		Moderate	60	2	1	4.44	Right
26	Bank Stabilization	Erosion	WESTFIELD BORO	41.917188	-77.544063		Moderate	300	20	10	2,222.22	Right
27	Debris Management	Debris	WESTFIELD BORO	41.917393	-77.544885		Moderate	60	2	1	4.44	Right
28	Bank Stabilization	Erosion	WESTFIELD BORO	41.917707	-77.545860		Moderate	500	15	8	2,222.22	Left
29	Debris Management	Debris	WESTFIELD BORO	41.917874	-77.548522		Moderate	60	2	1	4.44	Left
30	Debris Management	Debris	WESTFIELD TWP	41.914873	-77.589665	Behind food shelter	High	100	50	10	1,851.85	Both
31	Debris Management	Debris	WESTFIELD BORO	41.917692	-77.549659		Moderate	25	6	6	33.33	Left
32	Debris Management	Debris	WESTFIELD BORO	41.917602	-77.550267		Moderate	55	2	1	4.07	Right
33	Bank Stabilization	Erosion	WESTFIELD BORO	41.917581	-77.550566		Moderate	275	10	8	814.81	Left
34	Debris Management	Debris	WESTFIELD BORO	41.917328	-77.551521		Moderate	15	10	4	22.22	Right
35	Debris Management	Debris	WESTFIELD BORO	41.917289	-77.552088		High	45	2	1	3.33	Right
36	Bank Stabilization	Undercut Bank	WESTFIELD TWP	41.915322	-77.573660	Erosion	High	50	10	12	322.22	Right
37	Debris Management	Debris	WESTFIELD TWP	41.914779	-77.574481	Trees	High/Critical	1000	50	3	5,555.56	Both
38	Debris Management	Gravel Bar	WESTFIELD TWP	41.916827	-77.587791		Critical	125	40	4	740.74	Left
39	Debris Management	Debris	WESTFIELD TWP	41.916827	-77.588731		High	15	10	12	333.33	Left
40	Debris Management	Debris	WESTFIELD TWP	41.916876	-77.588940		Moderate	15	15	15	125.00	N/A
41	Debris Management	Debris	WESTFIELD TWP	41.916876	-77.589428		High	15	14	8	66.47	Both

Field Inspections



- **Recommendations for setting up successful field work.**
 - ✓ Inspection grade does not require expensive or complex setups. Galaxy/Apple phones and tablets should be utilized.
 - ✓ Precision not necessary, but accuracy is important. Pair gadgets GPS/Bluetooth antennas.
 - ✓ Think about an appropriate field/survey design.
 - ✓ Create a field map or ESRI ArcGIS Online dashboard so the team can track progress.

Field Inspections

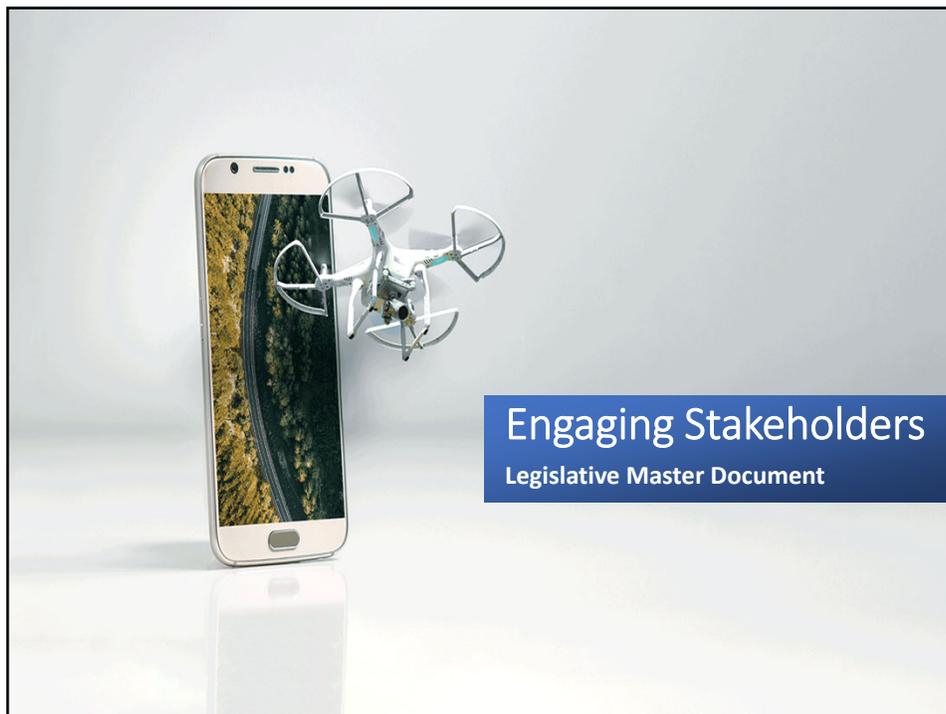


- **Recommendations for setting up successful field work.**
 - ✓ Create at least one field, in the field design, for general comments (but not too many).
 - ✓ Deciding on your field app for data collection.
 - ❖ Survey 123 more friendly for general users. Limitations with photo attachments (workaround: create several photo fields).
 - ❖ ArcGIS Field Maps not as user friendly, better for image attachment capture.

Field Inspections



- **Recommendations for setting up successful field work.**
 - ✓ **IMPORTANT:** Download points from ArcGIS Online into a file-geodatabase for desktop mapping and other derivative uses – *this preserves the links to the images by way of a relationship class.*
 - ❖ A significant component of the project is lost when images are not directly attached 1:1 with the points.
 - ❖ File-geodatabase can be shared with the images included and lines to the points preserved.



Engaging Stakeholders



- Streambank stabilization and debris removal are critical to protecting infrastructure, property, and ecosystems.
- Community collaboration is essential to long-term success.
- ***Need to actively engage legislative stakeholders and key decision makers to secure support, funding, and policy alignment.***

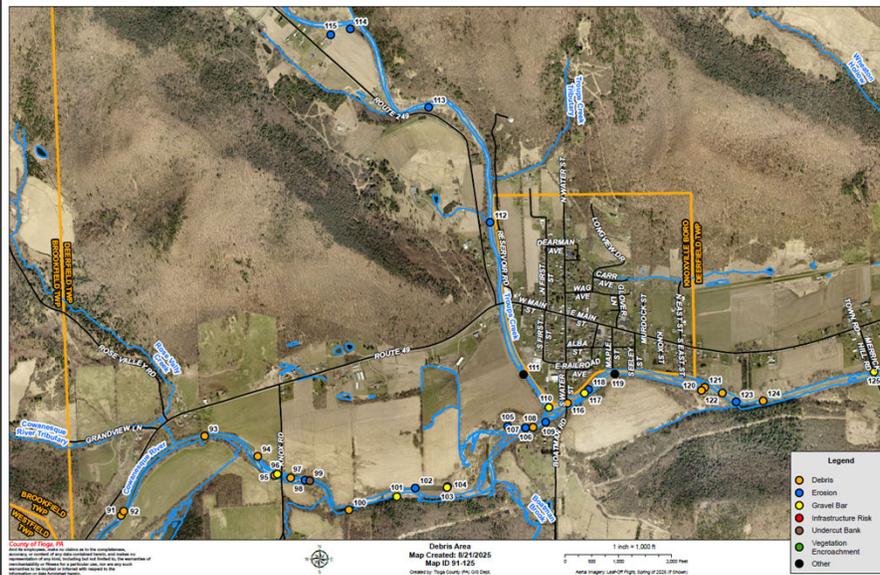
Engaging Stakeholders



Debris Management	Map ID: 164
<p>DEERFIELD TWP (Y) Lat: 41.968025 (X) Long: -77.373544</p> <p>Debris Severity: Low Length: 100 ft Width: 4 ft Height: 3 ft Cubic Yards: 44.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

- Provides accurate mapping of erosion, debris accumulation, and at-risk areas.
- Supports data-driven decision-making for stabilization design and prioritization.
- Creates visual tools (maps, dashboards) for stakeholders to understand project impacts.

Engaging Stakeholders



Conclusions



Simple Conclusion

Without advanced geospatial tools, organizing data to support successful funding applications within today's digital systems would be nearly impossible.

Questions / Answers?

Thank you for attending!



Section 7

Mitigation Techniques



Trends & Techniques for Streambank Stabilization and Debris Removal Cowanesque Valley, Tioga County (Post–Aug 2024 Flooding)

Below is a compact, Pennsylvania-specific overview of post-flood debris removal and streambank stabilization *mitigation* techniques that can be applied in the Cowanesque Valley following the August 2024 flooding.

1) Immediate Post-Flood Actions (Debris & Safety)

- Targeted debris removal at bridges/culverts and constrictions; avoid wholesale dredging or pushing gravel onto banks. Preserve channel dimensions and leave stable wood that’s not posing risk. [\(Click Here\)](#)
- Use the NRCS Emergency Watershed Protection (EWP) program for funded debris removal, emergency bank protection, and related recovery measures; PA has a state page and contacts. [\(Click Here\)](#)
- Follow DEP’s “Guidelines for Maintaining Streams in Your Community” for what work is allowed and which permits/authorizations apply during recovery. [\(Click Here\)](#)

2) Bank Stabilization — Bioengineering (Preferred)

- Live stakes (willow/dogwood), fascines, brush mattresses, vegetated soil lifts/geogrids, coir fiber rolls: rebuild roughness and bank strength; pair with riparian plantings. [\(Click Here\)](#)
- Toe-wood/rootwad revetments & large wood additions: protect the toe, deflect flow, and create habitat while banks revegetate. [\(Click Here\)](#)
- Riparian buffer restoration & livestock exclusion to reduce chronic erosion sources (Penn State Extension). [\(Click Here\)](#)

3) Hybrid & structural measures (use where hydraulics/infrastructure demand it)

- Rock toe with vegetated lifts (hybrid “green-gray”) to armor the lower bank and let upper bank revegetate. [\(Click Here\)](#)
- Redirective rock/log structures: *rock vanes*, *J-hook vanes*, *cross-vanes*, *log vanes/mudsills*—push velocity core off the bank, provide grade control, and form scour pools. (Commonly used/approved in PA fish-habitat/stability projects.) [\(Click Here\)](#) & [\(Click Here\)](#)



- Riprap revetment (proper sizing, keyed toe, filter fabric/stone) where immediate, high-energy protection is required; integrate plantings for long-term resilience. [\(Click Here\)](#)

4) Channel/floodplain recovery (medium- to long-term)

- Bank re-grading + floodplain/bench creation to reduce near-bank shear and reconnect overbank flows (Natural Channel Design approach). [\(Click Here\)](#)
- Floodplain restoration as a BMP to reduce erosive energy and trap sediment. [\(Click Here\)](#)
- Crossing upgrades (span bankfull width, appropriate embed, natural substrate) to prevent backwatering/erosion at roads. [\(Click Here\)](#)

5) Field playbook for heavy-equipment recovery

- Emergency Stream Intervention (ESI) method (dimension–pattern–profile): practical, post-flood roadway/municipal guidance for reshaping channels, addressing bars, and placing wood/rock correctly. (Developed in the Upper Susquehanna; widely used in PA/NY after floods.) [\(Click Here\)](#) & [\(Click Here\)](#)

6) Local examples you can point to (Tioga County area)

- Blossburg Island Park (Tioga River)—2024 effort stabilized ~200–300 ft using muddills, log/rock structures; partners included Tioga County Conservation District, TU, NPC (photos & write-ups). [\(Click Here\)](#) & [\(Click Here\)](#)
- Tioga County Conservation District—local technical assistance & permitting coordination. [\(Click Here\)](#)

Who to call / programs

- DEP Chapter 105: Use the DEP “Maintaining Streams” booklet for when GP-3/GP-11 and emergency authorizations apply; contact Northcentral Regional Office early. [\(Click Here\)](#)
- NRCS EWP (Pennsylvania): Sponsorship and funding for debris removal, emergency bank protection, vegetative cover. [\(Click Here\)](#)



- SRBC & County CAP: Regional coordination and funding pathways connected to stream restoration/stabilization in Tioga County. [\(Click Here\)](#) & [\(Click Here\)](#)

Handy illustrated references (with photos/diagrams)

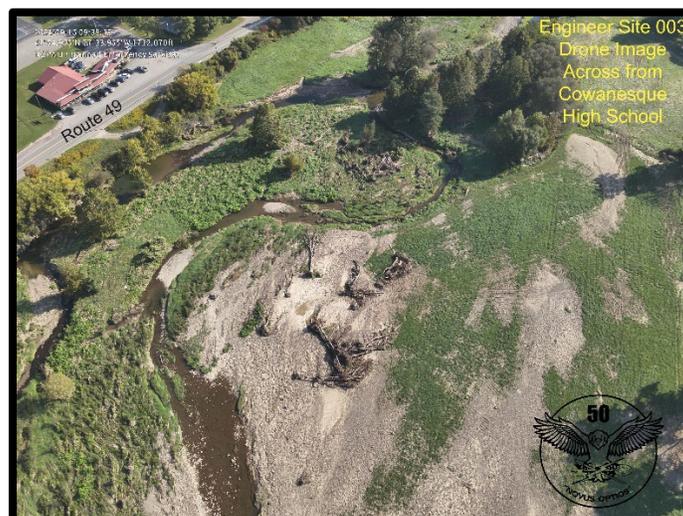
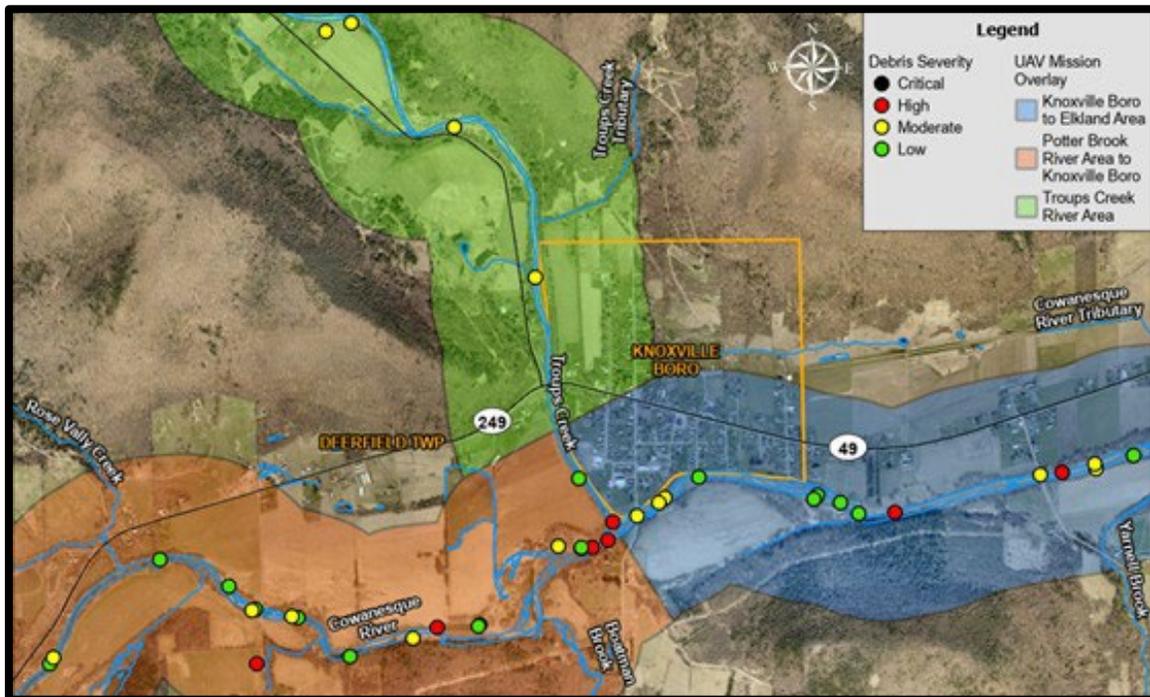
- NRCS Engineering Field Handbook Ch. 16: comprehensive details on riprap, soil-bioengineering, design checks. [\(Click Here\)](#)
- NRCS EFH Ch. 16 (Soil Bioengineering): plant-based bank protection techniques & construction notes. [\(Click Here\)](#)
- DEP “Guidelines for Maintaining Streams in Your Community”: PA-specific DOs/DON’Ts, emergency vs. permitted work. [\(Click Here\)](#)
- PFBC habitat structures (rock/J-hook/cross-vane, mudsills): stability + habitat designs used statewide. [\(Click Here\)](#)
- Penn State Extension—Streambank Stabilization: modern, photo-rich overview (examples credited to Tioga County CD). [\(Click Here\)](#)



Section 8

Project Fieldwork

Executive Summary



Tioga County Mitigation Advisory Committee

MAC

Mission: Regularly assemble members of various governmental and nongovernmental agencies whose expertise shall contribute to the implementation of both immediate and long-term hazard mitigation strategies for Tioga County, Pennsylvania.

Scott Zubek, GISP (Chairperson) • Phone: (570) 723-8253 • Email: szubek@tiogacountypa.us

EXECUTIVE SUMMARY OF FIELDWORK

Streambank Stabilization Project Categories and Location

The following tables summarize project locations by category. Each category reflects specific conditions identified during field assessments, with associated **Label ID Numbers** referencing mapped sites in the GIS database. These IDs also correspond to the Project Information entries included within this section. This information is provided to support prioritization, planning, and implementation of streambank stabilization and debris removal projects.

Note: Label IDs are to be read from left to right within each row. This ordering reflects the geographic sequencing of points on the corresponding maps, moving west to east along the Cowanesque river.

Debris

5	8	10	13	21	27
29	30	31	33	34	35
36	37	39	40	41	43
44	45	47	49	51	52
57	59	61	65	66	67
69	70	74	76	77	79
80	81	85	87	88	89
91	92	93	94	95	97
100	104	106	108	116	120
121	122	124	127	131	133
136	137	139	140	143	144
146	147	148	152	154	155
158	164	166	168	170	176
178	179	182	184	187	189
191	192	193	195	199	202
204	206	207	212	213	214

Erosion

1	25	26	32	42	46
48	50	54	56	58	64
68	71	72	73	75	98
102	105	107	109	112	113
114	115	118	123	161	163

Gravel Bar

7	14	15	18	19	20
22	24	38	55	78	82
83	84	86	96	101	103
110	117	125	126	129	130
132	134	135	138	141	142
145	150	153	156	157	159
162	165	167	169	172	173
174	177	180	181	183	186
190	194	196	197	198	200
201	203	205	208	209	210
211					

Infrastructure Risk

2	6	53	90		
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Undercut Bank

4	12	16	17	23	28
60	62	63	99	128	171
188					

Vegetation Encroachment

3	9	11	185		
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Other (Access Points, Etc.)

111	119	149	151	160	175
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Prioritization and Next Steps

The initial categorization of project locations, such as gravel bar restoration and bank stabilization, has been completed. The next phase involves ranking and prioritizing these locations to guide funding requests, permit applications, and phased implementation.

The prioritization framework being considered may involve scoring each site based on the type of impact, with the highest priority assigned to those affecting communities, followed by impacts on infrastructure and agricultural areas. The physical severity of each condition may also serve as a primary or supporting factor in this process.

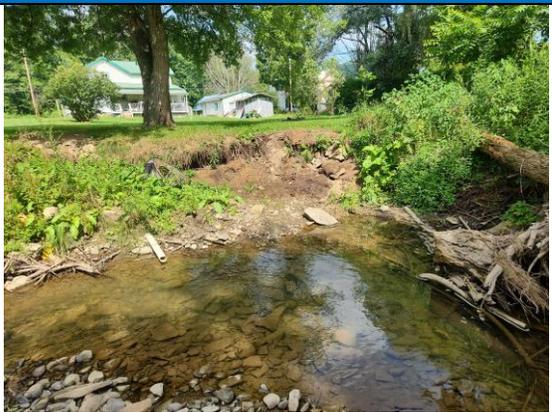
During recent discussions of the Mitigation Advisory Committee (MAC), members reviewed various ranking systems used by partner agencies. As the plan evolves, the MAC will play a central role in guiding how fieldwork findings and associated data are prioritized. This includes helping to identify suitable ranking methods and ensuring that selected approaches align with local needs, regulatory considerations, and funding strategies.

A finalized ranking of project locations will be presented in subsequent documents. These rankings will be used to support grant applications and to determine the priority and sequence of debris removal and streambank stabilization activities. Special consideration will be given to debris-related sites that were not approved under previous program funding guidelines and may require separate treatment.

Bank Stabilization	Map ID: 1
<p>WESTFIELD TWP (Y) Lat: 41.910271 (X) Long: -77.604310</p> <p>Erosion Severity: Moderate Length: 20 ft Width: 10 ft Height: 5 ft Cubic Yards: 37.04 Immediate Concern: No Suggested Action:</p> <p>Comments: Eroding to within 20 feet of state road.</p>	

Debris Management	Map ID: 2
<p>WESTFIELD TWP (Y) Lat: 41.910611 (X) Long: -77.604305</p> <p>Infrastructure Risk Severity: High Length: 80 ft Width: 20 ft Height: 8 ft Cubic Yards: 474.07 Immediate Concern: Yes Suggested Action: Other</p> <p>Comments: Total 80 lineal feet of 1 foot diameter trees plus smaller limbs and a large root ball about 120 feet upstream from a small state road bridge.</p>	

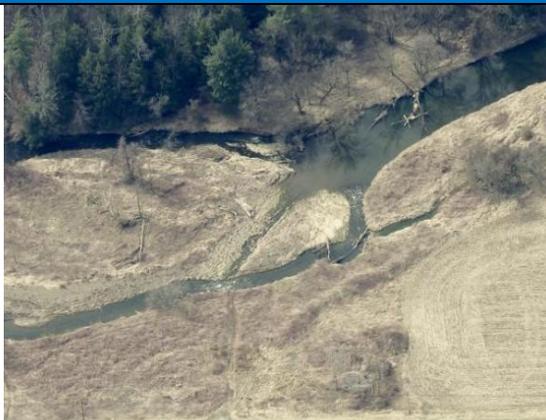
Debris Management	Map ID: 3
<p>WESTFIELD TWP (Y) Lat: 41.910975 (X) Long: -77.603697</p> <p>Vegetation Encroachment Severity: Low Length: 50 ft Width: 15 ft Height: 25 ft Cubic Yards: 694.44 Immediate Concern: No Suggested Action:</p> <p>Comments: Medium size tree overhanging stream with other wood debris piled behind it.</p>	

Bank Stabilization	Map ID: 4
<p>WESTFIELD TWP (Y) Lat: 41.911199 (X) Long: -77.603135</p> <p>Undercut Bank Severity: Moderate Length: 15 ft Width: 12 ft Height: 6 ft Cubic Yards: 40.00 Immediate Concern: No Suggested Action:</p> <p>Comments: Undercut to lawn with wooded debris that will encourage more erosion.</p>	

Debris Management	Map ID: 5
<p>WESTFIELD TWP (Y) Lat: 41.912012 (X) Long: -77.602863</p> <p>Debris Severity: Moderate Length: 10 ft Width: 6 ft Height: 5 ft Cubic Yards: 11.11 Immediate Concern: No Suggested Action:</p> <p>Comments: Debris against pier of private bridge.</p>	

Infrastructure Protection	Map ID: 6
<p>WESTFIELD TWP (Y) Lat: 41.912575 (X) Long: -77.603722</p> <p>Infrastructure Risk Severity: Moderate Length: 10 ft Width: 4 ft Height: 6 ft Cubic Yards: 8.89 Immediate Concern: No Suggested Action:</p> <p>Comments: Debris stuck on bridge.</p>	

Infrastructure Protection	Map ID: 7
<p>WESTFIELD TWP (Y) Lat: 41.912376 (X) Long: -77.603179</p> <p>Gravel Bar Severity: Moderate Length: 50 ft Width: 12 ft Height: 1 ft Cubic Yards: 22.22 Immediate Concern: No Suggested Action:</p> <p>Comments: South bank.</p>	

Debris Management	Map ID: 8
<p>WESTFIELD TWP (Y) Lat: 41.912421 (X) Long: -77.596337</p> <p>Debris Severity: High Length: 500 ft Width: 12 ft Height: 4 ft Cubic Yards: 888.89 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Revisit with plan of access. Not too far from the bridge and an industrial plant.</p>	

Infrastructure Protection	Map ID: 9
<p>WESTFIELD TWP (Y) Lat: 41.912898 (X) Long: -77.591567</p> <p>Vegetation Encroachment Severity: Moderate Length: 100 ft Width: 10 ft Height: 1.5 ft Cubic Yards: 55.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Vegetation and rocks.</p>	

Debris Management	Map ID: 10
<p>WESTFIELD TWP (Y) Lat: 41.914865 (X) Long: -77.585062</p> <p>Debris Severity: High Length: 100 ft Width: 50 ft Height: 10 ft Cubic Yards: 1851.85 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Large tree stump near homes and bridge. Homes would be affected in flooding. Tributary flows into river.</p>	

Debris Management	Map ID: 11
<p>WESTFIELD TWP (Y) Lat: 41.914879 (X) Long: -77.584074</p> <p>Vegetation Encroachment Severity: High Length: 100 ft Width: 14 ft Height: 8 ft Cubic Yards: 414.81 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Bottleneck.</p>	

Bank Stabilization	Map ID: 12
<p>WESTFIELD TWP (Y) Lat: 41.914593 (X) Long: -77.580837</p> <p>Undercut Bank Severity: Moderate Length: 400 ft Width: 5 ft Height: 10 ft Cubic Yards: 740.74 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: Bank is about plus 10 ft high. Piping exposed. Bank could collapse on pipe.</p>	

Debris Management	Map ID: 13
<p>WESTFIELD TWP (Y) Lat: 41.914670 (X) Long: -77.579901</p> <p>Debris Severity: Moderate Length: 7 ft Width: 7 ft Height: 4 ft Cubic Yards: 7.26 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Large tree stump near bridge. Significant debris along bank.</p>	

Infrastructure Protection	Map ID: 14
<p>WESTFIELD TWP (Y) Lat: 41.914509 (X) Long: -77.579757</p> <p>Gravel Bar Severity: High Length: 155 ft Width: 30 ft Height: 2.5 ft Cubic Yards: 430.56 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Under bridge, severe. Near homes and barns.</p>	

Infrastructure Protection	Map ID: 15
<p>WESTFIELD TWP (Y) Lat: 41.914415 (X) Long: -77.579478</p> <p>Gravel Bar Severity: High Length: 50 ft Width: 20 ft Height: 1 ft Cubic Yards: 37.04 Immediate Concern: No Suggested Action:</p> <p>Comments: Center below bridge. Threatening bridge infrastructure.</p>	

Bank Stabilization	Map ID: 16
<p>WESTFIELD TWP (Y) Lat: 41.913146 (X) Long: -77.577377</p> <p>Undercut Bank Severity: High Length: 100 ft Width: 50 ft Height: 150 ft Cubic Yards: 27777.78 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: Bad cut. Near bridge.</p>	

Bank Stabilization	Map ID: 17
<p>WESTFIELD TWP (Y) Lat: 41.913218 (X) Long: -77.576821</p> <p>Undercut Bank Severity: High Length: 1000 ft Width: 50 ft Height: 75 ft Cubic Yards: 138888.89 Immediate Concern: No Suggested Action:</p> <p>Comments: Bad cut and debris.</p>	

Stream Restoration	Map ID: 18
<p>WESTFIELD TWP (Y) Lat: 41.913863 (X) Long: -77.575735</p> <p>Gravel Bar Severity: High Length: 800 ft Width: 50 ft Height: 2 ft Cubic Yards: 2962.96 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

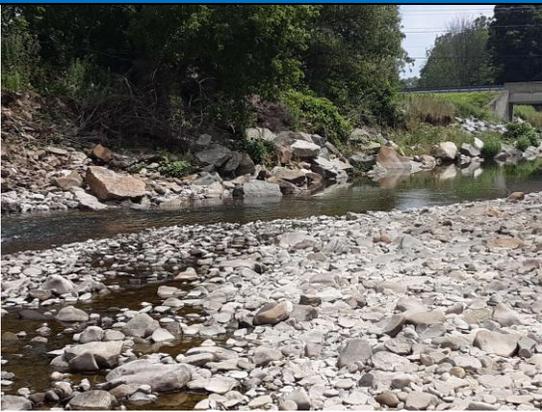
Stream Restoration	Map ID: 19
<p>WESTFIELD TWP (Y) Lat: 41.914213 (X) Long: -77.575381</p> <p>Gravel Bar Severity: High Length: 1000 ft Width: 50 ft Height: 2 ft Cubic Yards: 3703.70 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 20
<p>WESTFIELD TWP (Y) Lat: 41.914452 (X) Long: -77.574972</p> <p>Gravel Bar Severity: High Length: 1000 ft Width: 50 ft Height: 3 ft Cubic Yards: 5555.56 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Bad section.</p>	

Debris Management	Map ID: 21
<p>WESTFIELD TWP (Y) Lat: 41.914771 (X) Long: -77.574458</p> <p>Debris Severity: High Length: 1000 ft Width: 50 ft Height: 3 ft Cubic Yards: 5555.56 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Tree picture and bank erosion. Near a bridge, homes, and school nearby.</p>	

Stream Restoration	Map ID: 22
<p>WESTFIELD TWP (Y) Lat: 41.914987 (X) Long: -77.574148</p> <p>Gravel Bar Severity: High Length: 20 ft Width: 20 ft Height: 7 ft Cubic Yards: 103.70 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Tributary.</p>	

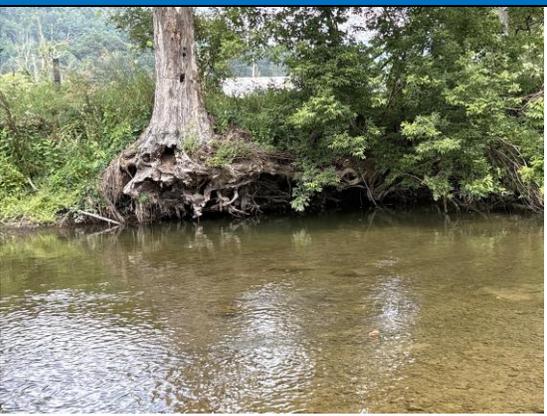
Bank Stabilization	Map ID: 23
<p>WESTFIELD TWP (Y) Lat: 41.915314 (X) Long: -77.573657</p> <p>Undercut Bank Severity: High Length: 50 ft Width: 10 ft Height: 12 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 24
<p>WESTFIELD TWP (Y) Lat: 41.915709 (X) Long: -77.572317</p> <p>Gravel Bar Severity: Moderate Length: 100 ft Width: 25 ft Height: 2 ft Cubic Yards: 185.19 Immediate Concern: No Suggested Action:</p> <p>Comments: Gravel bar crance brook.</p>	

Bank Stabilization	Map ID: 25
<p>WESTFIELD TWP (Y) Lat: 41.915553 (X) Long: -77.570912</p> <p>Erosion Severity: Moderate Length: 125 ft Width: 6 ft Height: 8 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 26
<p>WESTFIELD TWP (Y) Lat: 41.915708 (X) Long: -77.570656</p> <p>Erosion Severity: Low Length: 75 ft Width: 8 ft Height: 9 ft Cubic Yards: 200.00 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 27
<p>WESTFIELD TWP (Y) Lat: 41.915682 (X) Long: -77.569522</p> <p>Debris Severity: Low Length: 10 ft Width: 6 ft Height: 4 ft Cubic Yards: 8.89 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 28
<p>WESTFIELD TWP (Y) Lat: 41.915711 (X) Long: -77.569108</p> <p>Undercut Bank Severity: Low Length: 100 ft Width: 7 ft Height: 7 ft Cubic Yards: 181.48 Immediate Concern: No Suggested Action:</p> <p>Comments: No threat to homes.</p>	

Debris Management	Map ID: 29
<p>WESTFIELD TWP (Y) Lat: 41.915711 (X) Long: -77.567657</p> <p>Debris Severity: Low Length: 12 ft Width: 2 ft Height: 1 ft Cubic Yards: 0.89 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 30
<p>WESTFIELD TWP (Y) Lat: 41.915745 (X) Long: -77.567311</p> <p>Debris Severity: Moderate Length: 10 ft Width: 10 ft Height: 2 ft Cubic Yards: 7.41 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 31
<p>WESTFIELD TWP (Y) Lat: 41.916020 (X) Long: -77.566140</p> <p>Debris Severity: Low Length: 15 ft Width: 15 ft Height: 8 ft Cubic Yards: 66.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 32
<p>WESTFIELD TWP (Y) Lat: 41.917028 (X) Long: -77.563724</p> <p>Erosion Severity: Moderate Length: 250 ft Width: 5 ft Height: 8 ft Cubic Yards: 370.37 Immediate Concern: No Suggested Action:</p> <p>Comments: Houses next to creek with erosion.</p>	

Debris Management	Map ID: 33
<p>WESTFIELD TWP (Y) Lat: 41.917279 (X) Long: -77.561723</p> <p>Debris Severity: Moderate Length: 8 ft Width: 6 ft Height: 5 ft Cubic Yards: 8.89 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 34
<p>WESTFIELD TWP (Y) Lat: 41.917359 (X) Long: -77.561366</p> <p>Debris Severity: Moderate Length: 25 ft Width: 4 ft Height: 3 ft Cubic Yards: 11.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 35
<p>WESTFIELD TWP (Y) Lat: 41.917264 (X) Long: -77.560817</p> <p>Debris Severity: Moderate Length: 25 ft Width: 10 ft Height: 10 ft Cubic Yards: 92.59 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 36
<p>WESTFIELD TWP (Y) Lat: 41.916868 (X) Long: -77.558937</p> <p>Debris Severity: Low Length: 15 ft Width: 15 ft Height: 15 ft Cubic Yards: 125.00 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 37
<p>WESTFIELD TWP (Y) Lat: 41.916868 (X) Long: -77.558937</p> <p>Debris Severity: Moderate Length: 15 ft Width: 15 ft Height: 8 ft Cubic Yards: 66.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 38
<p>WESTFIELD TWP (Y) Lat: 41.916819 (X) Long: -77.558728</p> <p>Gravel Bar Severity: Moderate Length: 125 ft Width: 40 ft Height: 4 ft Cubic Yards: 740.74 Immediate Concern: No Suggested Action:</p> <p>Comments: Confluence of North Fork.</p>	

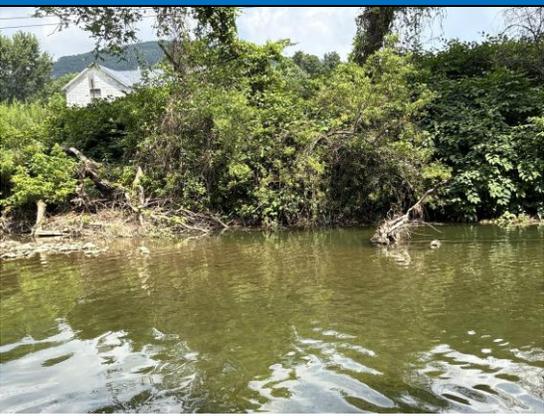
Debris Management	Map ID: 39
<p>WESTFIELD TWP (Y) Lat: 41.916819 (X) Long: -77.558728</p> <p>Debris Severity: Moderate Length: 75 ft Width: 10 ft Height: 12 ft Cubic Yards: 333.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 40
<p>WESTFIELD BORO (Y) Lat: 41.917260 (X) Long: -77.552085</p> <p>Debris Severity: Moderate Length: 45 ft Width: 2 ft Height: 1 ft Cubic Yards: 3.33 Immediate Concern: No Suggested Action:</p> <p>Comments: Across entire stream.</p>	

Debris Management	Map ID: 41
<p>WESTFIELD BORO (Y) Lat: 41.917320 (X) Long: -77.551918</p> <p>Debris Severity: Low Length: 15 ft Width: 10 ft Height: 4 ft Cubic Yards: 22.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 42
<p>WESTFIELD BORO (Y) Lat: 41.917572 (X) Long: -77.550564</p> <p>Erosion Severity: Moderate Length: 275 ft Width: 10 ft Height: 8 ft Cubic Yards: 814.81 Immediate Concern: No Suggested Action:</p> <p>Comments: Close to guide railroad.</p>	

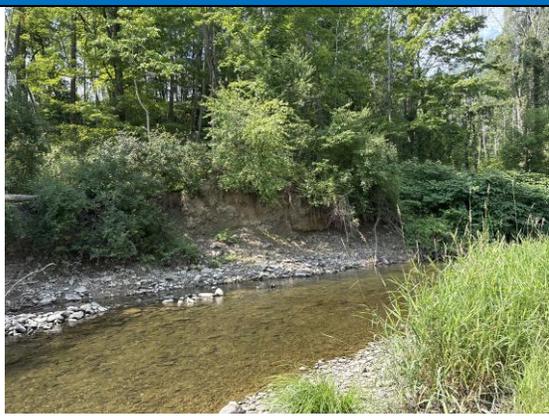
Debris Management	Map ID: 43
<p>WESTFIELD BORO (Y) Lat: 41.917594 (X) Long: -77.550265</p> <p>Debris Severity: Low Length: 55 ft Width: 2 ft Height: 1 ft Cubic Yards: 4.07 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 44
<p>WESTFIELD BORO (Y) Lat: 41.917684 (X) Long: -77.549656</p> <p>Debris Severity: Low Length: 25 ft Width: 6 ft Height: 6 ft Cubic Yards: 33.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 45
<p>WESTFIELD BORO (Y) Lat: 41.917866 (X) Long: -77.548520</p> <p>Debris Severity: Low Length: 60 ft Width: 2 ft Height: 1 ft Cubic Yards: 4.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 46
<p>WESTFIELD BORO (Y) Lat: 41.917698 (X) Long: -77.545887</p> <p>Erosion Severity: Moderate Length: 500 ft Width: 15 ft Height: 8 ft Cubic Yards: 2222.22 Immediate Concern: No Suggested Action:</p> <p>Comments: Behind park. Some rip rap at west end.</p>	

Debris Management	Map ID: 47
<p>WESTFIELD BORO (Y) Lat: 41.917385 (X) Long: -77.544983</p> <p>Debris Severity: Low Length: 60 ft Width: 2 ft Height: 1 ft Cubic Yards: 4.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 48
<p>WESTFIELD BORO (Y) Lat: 41.917180 (X) Long: -77.544060</p> <p>Erosion Severity: Moderate Length: 300 ft Width: 20 ft Height: 10 ft Cubic Yards: 2222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 49
<p>WESTFIELD BORO (Y) Lat: 41.917310 (X) Long: -77.543836</p> <p>Debris Severity: Low Length: 60 ft Width: 2 ft Height: 1 ft Cubic Yards: 4.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 50
<p>WESTFIELD BORO (Y) Lat: 41.921948 (X) Long: -77.538015</p> <p>Erosion Severity: Low Length: 700 ft Width: 20 ft Height: 10 ft Cubic Yards: 5185.19 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 51
<p>WESTFIELD BORO (Y) Lat: 41.921934 (X) Long: -77.537768</p> <p>Debris Severity: Low Length: 2 ft Width: 0.5 ft Height: 0.5 ft Cubic Yards: 0.02 Immediate Concern: No Suggested Action:</p> <p>Comments: Scrap Metal.</p>	

Debris Management	Map ID: 52
<p>WESTFIELD BORO (Y) Lat: 41.921888 (X) Long: -77.537515</p> <p>Debris Severity: Length: 4 ft Width: 0.2999999999999999 ft Height: 0.2999999999999999 ft Cubic Yards: 0.01 Immediate Concern: No Suggested Action:</p> <p>Comments: Scrap Metal.</p>	

Infrastructure Protection	Map ID: 53
<p>WESTFIELD BORO (Y) Lat: 41.921714 (X) Long: -77.535834</p> <p>Infrastructure Risk Severity: High Length: 40 ft Width: 2 ft Height: 2 ft Cubic Yards: 5.93 Immediate Concern: Yes Suggested Action: Other</p> <p>Comments: Exposed 12 inch steel pipe.</p>	

Bank Stabilization	Map ID: 54
<p>WESTFIELD BORO (Y) Lat: 41.921769 (X) Long: -77.535602</p> <p>Erosion Severity: Moderate Length: 100 ft Width: 20 ft Height: 15 ft Cubic Yards: 1111.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 55
<p>WESTFIELD BORO (Y) Lat: 41.921938 (X) Long: -77.534976</p> <p>Gravel Bar Severity: Low Length: 75 ft Width: 60 ft Height: 1 ft Cubic Yards: 166.67 Immediate Concern: No Suggested Action:</p> <p>Comments: Flooding threat to Tier II Facility.</p>	

Bank Stabilization	Map ID: 56
<p>WESTFIELD BORO (Y) Lat: 41.922897 (X) Long: -77.532026</p> <p>Erosion Severity: Moderate Length: 150 ft Width: 10 ft Height: 15 ft Cubic Yards: 833.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 57
<p>WESTFIELD BORO (Y) Lat: 41.922925 (X) Long: -77.531778</p> <p>Debris Severity: High Length: 20 ft Width: 20 ft Height: 25 ft Cubic Yards: 370.37 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 58
<p>WESTFIELD TWP (Y) Lat: 41.923195 (X) Long: -77.529838</p> <p>Erosion Severity: Moderate Length: 300 ft Width: 20 ft Height: 9 ft Cubic Yards: 2000.00 Immediate Concern: No Suggested Action:</p> <p>Comments: Behind occupied buildings.</p>	

Debris Management	Map ID: 59
<p>WESTFIELD TWP (Y) Lat: 41.924117 (X) Long: -77.528261</p> <p>Debris Severity: Low Length: 10 ft Width: 5 ft Height: 3 ft Cubic Yards: 5.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Portion of boat.</p>	

Bank Stabilization	Map ID: 60
<p>WESTFIELD TWP (Y) Lat: 41.924196 (X) Long: -77.528138</p> <p>Undercut Bank Severity: High Length: 175 ft Width: 5 ft Height: 3 ft Cubic Yards: 97.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

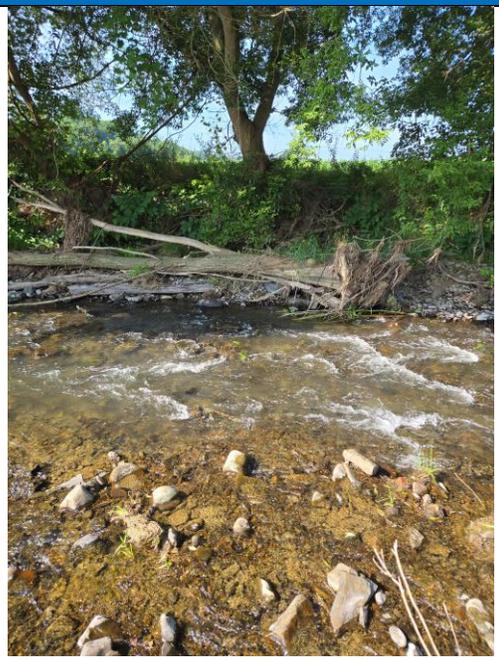
Debris Management	Map ID: 61
<p>WESTFIELD TWP (Y) Lat: 41.924380 (X) Long: -77.527831</p> <p>Debris Severity: Moderate Length: 40 ft Width: 10 ft Height: 10 ft Cubic Yards: 148.15 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 62
<p>WESTFIELD TWP (Y) Lat: 41.924777 (X) Long: -77.527149</p> <p>Undercut Bank Severity: High Length: 60 ft Width: 2 ft Height: 8 ft Cubic Yards: 35.56 Immediate Concern: Yes Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 63
<p>WESTFIELD TWP (Y) Lat: 41.924833 (X) Long: -77.527068</p> <p>Undercut Bank Severity: High Length: 40 ft Width: 6 ft Height: 6 ft Cubic Yards: 53.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 64
<p>WESTFIELD TWP (Y) Lat: 41.925654 (X) Long: -77.526281</p> <p>Erosion Severity: Moderate Length: 200 ft Width: 5 ft Height: 8 ft Cubic Yards: 296.30 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments:</p>	

Debris Management	Map ID: 65
<p>WESTFIELD TWP (Y) Lat: 41.926036 (X) Long: -77.526051</p> <p>Debris Severity: Low Length: 50 ft Width: 20 ft Height: 12 ft Cubic Yards: 444.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 66
<p>WESTFIELD TWP (Y) Lat: 41.926114 (X) Long: -77.521829</p> <p>Debris Severity: Low Length: 25 ft Width: 8 ft Height: 3 ft Cubic Yards: 22.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 67
<p>WESTFIELD TWP (Y) Lat: 41.925517 (X) Long: -77.521773</p> <p>Debris Severity: Moderate Length: 30 ft Width: 15 ft Height: 8 ft Cubic Yards: 133.33 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 68
<p>WESTFIELD TWP (Y) Lat: 41.924825 (X) Long: -77.521172</p> <p>Erosion Severity: High Length: 75 ft Width: 8 ft Height: 8 ft Cubic Yards: 177.78 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments:</p>	

Debris Management	Map ID: 69
<p>WESTFIELD TWP (Y) Lat: 41.924667 (X) Long: -77.520914</p> <p>Debris Severity: Low Length: 40 ft Width: 15 ft Height: 7 ft Cubic Yards: 155.56 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 70
<p>WESTFIELD TWP (Y) Lat: 41.924470 (X) Long: -77.520615</p> <p>Debris Severity: Moderate Length: 50 ft Width: 50 ft Height: 10 ft Cubic Yards: 925.93 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

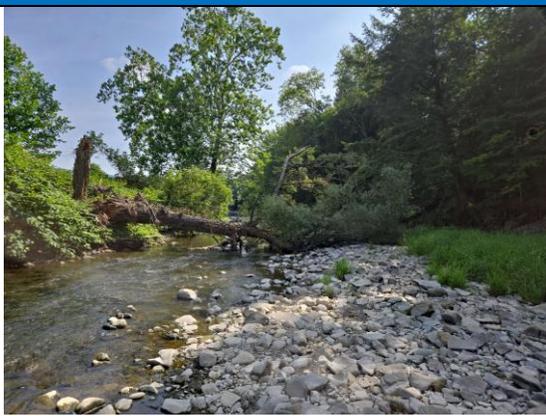
Bank Stabilization	Map ID: 71
<p>WESTFIELD TWP (Y) Lat: 41.923469 (X) Long: -77.518828</p> <p>Erosion Severity: High Length: 300 ft Width: 15 ft Height: 20 ft Cubic Yards: 3333.33 Immediate Concern: No Suggested Action:</p> <p>Comments: Beginning for distance.</p>	

Bank Stabilization	Map ID: 72
<p>WESTFIELD TWP (Y) Lat: 41.923129 (X) Long: -77.517831</p> <p>Erosion Severity: High Length: 300 ft Width: 25 ft Height: 20 ft Cubic Yards: 5555.56 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: Mid point capture for distance.</p>	

Bank Stabilization	Map ID: 73
<p>WESTFIELD TWP (Y) Lat: 41.923765 (X) Long: -77.517014</p> <p>Erosion Severity: High Length: 400 ft Width: 25 ft Height: 20 ft Cubic Yards: 7407.41 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: End point for erosion.</p>	

Debris Management	Map ID: 74
<p>WESTFIELD TWP (Y) Lat: 41.924131 (X) Long: -77.516825</p> <p>Debris Severity: Low Length: 25 ft Width: 10 ft Height: 5 ft Cubic Yards: 46.30 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 75
<p>WESTFIELD TWP (Y) Lat: 41.924746 (X) Long: -77.513632</p> <p>Erosion Severity: Low Length: 100 ft Width: 8 ft Height: 5 ft Cubic Yards: 148.15 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 76
<p>WESTFIELD TWP (Y) Lat: 41.925465 (X) Long: -77.510250</p> <p>Debris Severity: High Length: 75 ft Width: 10 ft Height: 8 ft Cubic Yards: 222.22 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Debris Management	Map ID: 77
<p>WESTFIELD TWP (Y) Lat: 41.928799 (X) Long: -77.503406</p> <p>Debris Severity: Moderate Length: 40 ft Width: 15 ft Height: 7 ft Cubic Yards: 155.56 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 78
<p>WESTFIELD TWP (Y) Lat: 41.928884 (X) Long: -77.503247</p> <p>Gravel Bar Severity: Moderate Length: 200 ft Width: 75 ft Height: 4 ft Cubic Yards: 2222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 79
<p>WESTFIELD TWP (Y) Lat: 41.931519 (X) Long: -77.502077</p> <p>Debris Severity: Moderate Length: 20 ft Width: 20 ft Height: 1 ft Cubic Yards: 14.81 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Long view.</p>	

Debris Management	Map ID: 80
<p>WESTFIELD TWP (Y) Lat: 41.931116 (X) Long: -77.501853</p> <p>Debris Severity: Moderate Length: 50 ft Width: 15 ft Height: 2 ft Cubic Yards: 55.56 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Tree and rock. Homes nearby.</p>	

Debris Management	Map ID: 81
<p>WESTFIELD TWP (Y) Lat: 41.930613 (X) Long: -77.501529</p> <p>Debris Severity: Low Length: 6 ft Width: 1 ft Height: 1 ft Cubic Yards: 0.22 Immediate Concern: No Suggested Action:</p> <p>Comments: Debris car bumper.</p>	

Stream Restoration	Map ID: 82
<p>WESTFIELD TWP (Y) Lat: 41.930003 (X) Long: -77.501098</p> <p>Gravel Bar Severity: Moderate Length: 100 ft Width: 20 ft Height: 1 ft Cubic Yards: 74.07 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Deep water not much access. Near homes and bridge.</p>	

Debris Management	Map ID: 83
<p>WESTFIELD TWP (Y) Lat: 41.930152 (X) Long: -77.501067</p> <p>Gravel Bar Severity: High Length: 50 ft Width: 50 ft Height: 2 ft Cubic Yards: 185.19 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Debris also present, huge tree down. Near bridge and homes.</p>	

Debris Management	Map ID: 84
<p>WESTFIELD TWP (Y) Lat: 41.930289 (X) Long: -77.500934</p> <p>Gravel Bar Severity: High Length: 300 ft Width: 50 ft Height: 2.5 ft Cubic Yards: 1388.89 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Long gravel bar looking both ways. Confluence of Purple Brook.</p>	

Debris Management	Map ID: 85
<p>WESTFIELD TWP (Y) Lat: 41.930587 (X) Long: -77.500284</p> <p>Debris Severity: Moderate Length: 50 ft Width: 50 ft Height: 2.5 ft Cubic Yards: 231.48 Immediate Concern: Yes Suggested Action: Restore Channel</p> <p>Comments: Gravel bar drastically affecting course of river.</p>	

Stream Restoration	Map ID: 86
<p>WESTFIELD TWP (Y) Lat: 41.930696 (X) Long: -77.499156</p> <p>Gravel Bar Severity: Moderate Length: 60 ft Width: 20 ft Height: 4 ft Cubic Yards: 177.78 Immediate Concern: No Suggested Action: Remove Debris</p> <p>Comments: South bank. Homes not far from river bank.</p>	

Debris Management	Map ID: 87
<p>WESTFIELD TWP (Y) Lat: 41.932534 (X) Long: -77.488941</p> <p>Debris Severity: Low Length: 30 ft Width: 15 ft Height: 7 ft Cubic Yards: 116.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 88
<p>WESTFIELD TWP (Y) Lat: 41.934256 (X) Long: -77.485277</p> <p>Debris Severity: Moderate Length: 50 ft Width: 15 ft Height: 12 ft Cubic Yards: 333.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 89
<p>WESTFIELD TWP (Y) Lat: 41.935069 (X) Long: -77.484228</p> <p>Debris Severity: Moderate Length: 75 ft Width: 15 ft Height: 5 ft Cubic Yards: 208.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Infrastructure Protection	Map ID: 90
<p>WESTFIELD TWP (Y) Lat: 41.942908 (X) Long: -77.474041</p> <p>Infrastructure Risk Severity: High Length: 200 ft Width: 1 ft Height: 1 ft Cubic Yards: 7.41 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: 8 inch steel pipe exposed crossing river.</p>	

Debris Management	Map ID: 91
<p>DEERFIELD TWP (Y) Lat: 41.946958 (X) Long: -77.470426</p> <p>Debris Severity: Low Length: 30 ft Width: 20 ft Height: 10 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 92
<p>DEERFIELD TWP (Y) Lat: 41.947177 (X) Long: -77.470248</p> <p>Debris Severity: Moderate Length: 60 ft Width: 15 ft Height: 10 ft Cubic Yards: 333.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

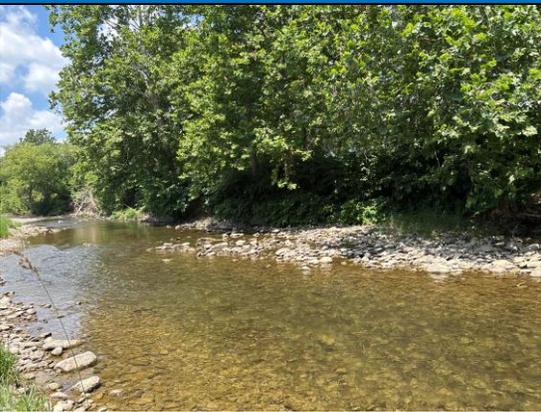
Debris Management	Map ID: 93
<p>DEERFIELD TWP (Y) Lat: 41.951032 (X) Long: -77.464645</p> <p>Debris Severity: Low Length: 25 ft Width: 10 ft Height: 4 ft Cubic Yards: 37.04 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 94
<p>DEERFIELD TWP (Y) Lat: 41.949978 (X) Long: -77.460990</p> <p>Debris Severity: Low Length: 15 ft Width: 15 ft Height: 5 ft Cubic Yards: 41.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

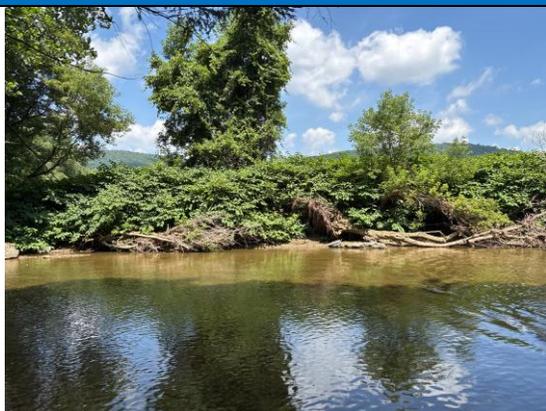
Debris Management	Map ID: 95
<p>DEERFIELD TWP (Y) Lat: 41.948998 (X) Long: -77.459814</p> <p>Debris Severity: Moderate Length: 30 ft Width: 8 ft Height: 5 ft Cubic Yards: 44.44 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Stream Restoration	Map ID: 96
<p>DEERFIELD TWP (Y) Lat: 41.949062 (X) Long: -77.459640</p> <p>Gravel Bar Severity: Low Length: 400 ft Width: 40 ft Height: 2 ft Cubic Yards: 1185.19 Immediate Concern: No Suggested Action:</p> <p>Comments: Possible yearly maintenance already being done.</p>	

Debris Management	Map ID: 97
<p>DEERFIELD TWP (Y) Lat: 41.948863 (X) Long: -77.458719</p> <p>Debris Severity: High Length: 60 ft Width: 6 ft Height: 5 ft Cubic Yards: 66.67 Immediate Concern: No Suggested Action:</p> <p>Comments: Debris and gravel bar.</p>	

Bank Stabilization	Map ID: 98
<p>DEERFIELD TWP (Y) Lat: 41.948745 (X) Long: -77.457725</p> <p>Erosion Severity: Moderate Length: 400 ft Width: 6 ft Height: 9 ft Cubic Yards: 800.00 Immediate Concern: No Suggested Action:</p> <p>Comments: Sawtooth through the trees not the whole length.</p>	

Bank Stabilization	Map ID: 99
<p>DEERFIELD TWP (Y) Lat: 41.948714 (X) Long: -77.457400</p> <p>Undercut Bank Severity: Low Length: 30 ft Width: 5 ft Height: 12 ft Cubic Yards: 66.67 Immediate Concern: No Suggested Action:</p> <p>Comments: Erosion and undercutting.</p>	

Debris Management	Map ID: 100
<p>DEERFIELD TWP (Y) Lat: 41.947206 (X) Long: -77.454707</p> <p>Debris Severity: Low Length: 75 ft Width: 2 ft Height: 2 ft Cubic Yards: 11.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 101
<p>DEERFIELD TWP (Y) Lat: 41.947881 (X) Long: -77.451399</p> <p>Gravel Bar Severity: Moderate Length: 400 ft Width: 30 ft Height: 2 ft Cubic Yards: 888.89 Immediate Concern: No Suggested Action:</p> <p>Comments: Potential gravel bar removal for flood relief. Need engineer.</p>	

Bank Stabilization	Map ID: 102
<p>DEERFIELD TWP (Y) Lat: 41.948319 (X) Long: -77.450124</p> <p>Erosion Severity: High Length: 300 ft Width: 6 ft Height: 8 ft Cubic Yards: 533.33 Immediate Concern: No Suggested Action:</p> <p>Comments: May already be an NCRS project.</p>	

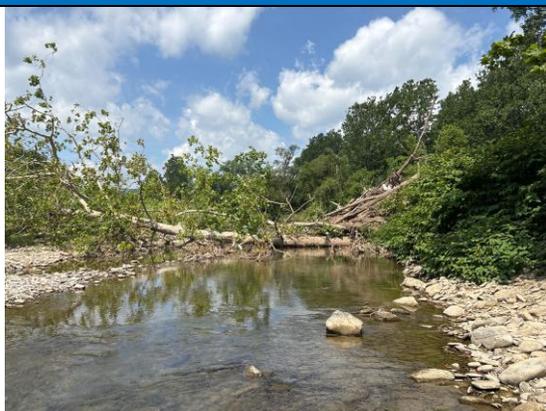
Stream Restoration	Map ID: 103
<p>DEERFIELD TWP (Y) Lat: 41.948348 (X) Long: -77.447925</p> <p>Gravel Bar Severity: Low Length: 500 ft Width: 30 ft Height: 4 ft Cubic Yards: 2222.22 Immediate Concern: No Suggested Action:</p> <p>Comments: Lower gravel bar for flood relief channel. Maintenance.</p>	

Debris Management	Map ID: 104
<p>DEERFIELD TWP (Y) Lat: 41.948392 (X) Long: -77.447896</p> <p>Debris Severity: Low Length: 45 ft Width: 4 ft Height: 3 ft Cubic Yards: 20.00 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 105
<p>DEERFIELD TWP (Y) Lat: 41.951477 (X) Long: -77.443736</p> <p>Erosion Severity: Moderate Length: 45 ft Width: 5 ft Height: 8 ft Cubic Yards: 66.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 106
<p>DEERFIELD TWP (Y) Lat: 41.951401 (X) Long: -77.442500</p> <p>Debris Severity: Low Length: 25 ft Width: 5 ft Height: 5 ft Cubic Yards: 23.15 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 107
<p>DEERFIELD TWP (Y) Lat: 41.951404 (X) Long: -77.442499</p> <p>Erosion Severity: Low Length: 120 ft Width: 6 ft Height: 15 ft Cubic Yards: 400.00 Immediate Concern: No Suggested Action:</p> <p>Comments: Field behind.</p>	

Debris Management	Map ID: 108
<p>DEERFIELD TWP (Y) Lat: 41.951425 (X) Long: -77.441979</p> <p>Debris Severity: High Length: 110 ft Width: 7 ft Height: 8 ft Cubic Yards: 228.15 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Tree with root ball and woody debris.</p>	

Bank Stabilization	Map ID: 109
<p>DEERFIELD TWP (Y) Lat: 41.951688 (X) Long: -77.441107</p> <p>Erosion Severity: High Length: 300 ft Width: 6 ft Height: 20 ft Cubic Yards: 1333.33 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: Erosion and sloping major. Homes extremely close.</p>	

Debris Management	Map ID: 110
<p>DEERFIELD TWP (Y) Lat: 41.952442 (X) Long: -77.440878</p> <p>Gravel Bar Severity: High Length: 450 ft Width: 45 ft Height: 4 ft Cubic Yards: 3000.00 Immediate Concern: No Suggested Action:</p> <p>Comments: Possibly already permitted work and maybe not complete. Confluence of Troups Creek.</p>	

Stream Restoration	Map ID: 111
<p>DEERFIELD TWP (Y) Lat: 41.954146 (X) Long: -77.442625</p> <p>other Severity: Low Length: 25 ft Width: 6 ft Height: 12 ft Cubic Yards: 66.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 112
<p>DEERFIELD TWP (Y) Lat: 41.961990 (X) Long: -77.444893</p> <p>Erosion Severity: Moderate Length: 500 ft Width: 10 ft Height: 10 ft Cubic Yards: 1851.85 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 113
<p>DEERFIELD TWP (Y) Lat: 41.967923 (X) Long: -77.449111</p> <p>Erosion Severity: Moderate Length: 50 ft Width: 8 ft Height: 10 ft Cubic Yards: 148.15 Immediate Concern: No Suggested Action:</p> <p>Comments: Sharp s curve in river impacts road.</p>	

Bank Stabilization	Map ID: 114
<p>DEERFIELD TWP (Y) Lat: 41.971971 (X) Long: -77.454505</p> <p>Erosion Severity: Moderate Length: 100 ft Width: 30 ft Height: 2 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments: Water cuts over on wrong side of bank and floods down to homes.</p>	

Bank Stabilization	Map ID: 115
<p>DEERFIELD TWP (Y) Lat: 41.971673 (X) Long: -77.455853</p> <p>Erosion Severity: Moderate Length: 250 ft Width: 6 ft Height: 8 ft Cubic Yards: 444.44 Immediate Concern: No Suggested Action:</p> <p>Comments: Behind homes. Too deep to walk full length for pictures.</p>	

Debris Management	Map ID: 116
<p>DEERFIELD TWP (Y) Lat: 41.952661 (X) Long: -77.439591</p> <p>Debris Severity: Moderate Length: 60 ft Width: 2 ft Height: 2 ft Cubic Yards: 8.89 Immediate Concern: No Suggested Action:</p> <p>Comments: Middle of river.</p>	

Stream Restoration	Map ID: 117
<p>DEERFIELD TWP (Y) Lat: 41.953171 (X) Long: -77.438420</p> <p>Gravel Bar Severity: Moderate Length: 400 ft Width: 75 ft Height: 2 ft Cubic Yards: 2222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 118
<p>DEERFIELD TWP (Y) Lat: 41.953365 (X) Long: -77.438143</p> <p>Erosion Severity: Moderate Length: 250 ft Width: 6 ft Height: 20 ft Cubic Yards: 1111.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 119
<p>DEERFIELD TWP (Y) Lat: 41.954155 (X) Long: -77.436323</p> <p>other Severity: Low Length: 700 ft Width: 100 ft Height: 5 ft Cubic Yards: 12962.96 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 120
<p>DEERFIELD TWP (Y) Lat: 41.953293 (X) Long: -77.430347</p> <p>Debris Severity: Low Length: 40 ft Width: 2 ft Height: 5 ft Cubic Yards: 14.81 Immediate Concern: No Suggested Action:</p> <p>Comments: Woody debris plus.</p>	

Debris Management	Map ID: 121
<p>DEERFIELD TWP (Y) Lat: 41.953446 (X) Long: -77.430122</p> <p>Debris Severity: Low Length: 50 ft Width: 6 ft Height: 9 ft Cubic Yards: 100.00 Immediate Concern: No Suggested Action:</p> <p>Comments: Woody debris and boat on bank.</p>	

Debris Management	Map ID: 122
<p>DEERFIELD TWP (Y) Lat: 41.953155 (X) Long: -77.428910</p> <p>Debris Severity: Low Length: 55 ft Width: 4 ft Height: 3 ft Cubic Yards: 24.44 Immediate Concern: No Suggested Action:</p> <p>Comments: Tree debris.</p>	

Bank Stabilization	Map ID: 123
<p>DEERFIELD TWP (Y) Lat: 41.952698 (X) Long: -77.427964</p> <p>Erosion Severity: Low Length: 100 ft Width: 5 ft Height: 7 ft Cubic Yards: 129.63 Immediate Concern: No Suggested Action:</p> <p>Comments: Erosion exposing possible farm dump.</p>	

Debris Management	Map ID: 124
<p>DEERFIELD TWP (Y) Lat: 41.952741 (X) Long: -77.426094</p> <p>Debris Severity: High Length: 105 ft Width: 2 ft Height: 2 ft Cubic Yards: 15.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Tree</p>	

Infrastructure Protection	Map ID: 125
<p>DEERFIELD TWP (Y) Lat: 41.954215 (X) Long: -77.418432</p> <p>Gravel Bar Severity: Moderate Length: 50 ft Width: 10 ft Height: 3 ft Cubic Yards: 55.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Center under bridge</p>	

Debris Management	Map ID: 126
<p>DEERFIELD TWP (Y) Lat: 41.954284 (X) Long: -77.417300</p> <p>Gravel Bar Severity: High Length: 250 ft Width: 60 ft Height: 2 ft Cubic Yards: 1111.11 Immediate Concern: Yes Suggested Action: Restore Channel</p> <p>Comments: Trees and debris. Near bridge.</p>	

Debris Management	Map ID: 127
<p>DEERFIELD TWP (Y) Lat: 41.954638 (X) Long: -77.415566</p> <p>Debris Severity: Moderate Length: 5 ft Width: 5 ft Height: 4 ft Cubic Yards: 3.70 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Tree. Near bridge and pipeline valve. Previous points also near valve.</p>	

Bank Stabilization	Map ID: 128
<p>DEERFIELD TWP (Y) Lat: 41.954432 (X) Long: -77.415476</p> <p>Undercut Bank Severity: Moderate Length: 100 ft Width: 3 ft Height: 10 ft Cubic Yards: 111.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 129
<p>DEERFIELD TWP (Y) Lat: 41.954959 (X) Long: -77.413566</p> <p>Gravel Bar Severity: Low Length: 400 ft Width: 40 ft Height: 2 ft Cubic Yards: 1185.19 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 130
<p>DEERFIELD TWP (Y) Lat: 41.955054 (X) Long: -77.411536</p> <p>Gravel Bar Severity: Low Length: 100 ft Width: 40 ft Height: 2 ft Cubic Yards: 296.30 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 131
<p>DEERFIELD TWP (Y) Lat: 41.955016 (X) Long: -77.410921</p> <p>Debris Severity: Moderate Length: 20 ft Width: 20 ft Height: 10 ft Cubic Yards: 148.15 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Tree and debris</p>	

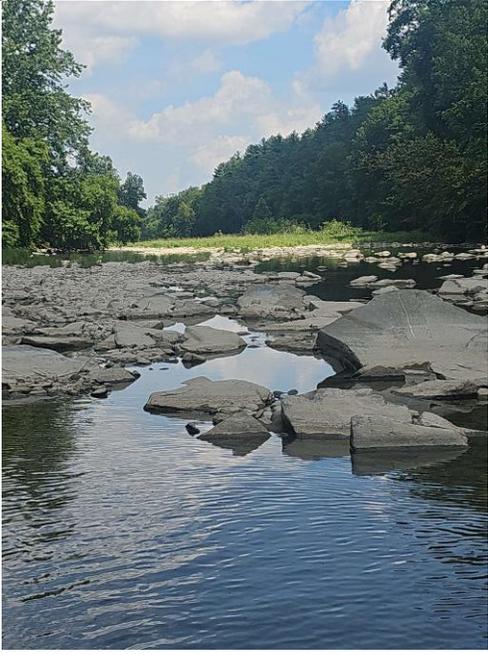
Stream Restoration	Map ID: 132
<p>DEERFIELD TWP (Y) Lat: 41.954921 (X) Long: -77.410831</p> <p>Gravel Bar Severity: Low Length: 100 ft Width: 10 ft Height: 1 ft Cubic Yards: 37.04 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 133
<p>DEERFIELD TWP (Y) Lat: 41.954344 (X) Long: -77.409960</p> <p>Debris Severity: Moderate Length: 50 ft Width: 7 ft Height: 10 ft Cubic Yards: 129.63 Immediate Concern: No Suggested Action:</p> <p>Comments: Trees on both sides of bank.</p>	

Stream Restoration	Map ID: 134
<p>DEERFIELD TWP (Y) Lat: 41.954301 (X) Long: -77.409659</p> <p>Gravel Bar Severity: Low Length: 50 ft Width: 20 ft Height: 1 ft Cubic Yards: 37.04 Immediate Concern: No Suggested Action:</p> <p>Comments: Center of stream</p>	

Stream Restoration	Map ID: 135
<p>DEERFIELD TWP (Y) Lat: 41.954139 (X) Long: -77.409308</p> <p>Gravel Bar Severity: High Length: 75 ft Width: 50 ft Height: 2 ft Cubic Yards: 277.78 Immediate Concern: No Suggested Action:</p> <p>Comments: Gravel bars on both sides of the river. Confluence of Yarnell Brook</p>	

Debris Management	Map ID: 136
<p>DEERFIELD TWP (Y) Lat: 41.954337 (X) Long: -77.407915</p> <p>Debris Severity: Moderate Length: 40 ft Width: 1 ft Height: 1 ft Cubic Yards: 1.48 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 137
<p>DEERFIELD TWP (Y) Lat: 41.954513 (X) Long: -77.407741</p> <p>Debris Severity: Moderate Length: 50 ft Width: 50 ft Height: 1 ft Cubic Yards: 92.59 Immediate Concern: No Suggested Action:</p> <p>Comments: Rocks</p>	

Stream Restoration	Map ID: 138
<p>DEERFIELD TWP (Y) Lat: 41.955048 (X) Long: -77.406452</p> <p>Gravel Bar Severity: Low Length: 600 ft Width: 30 ft Height: 2 ft Cubic Yards: 1333.33 Immediate Concern: No Suggested Action: Restore Channel</p> <p>Comments:</p>	

Debris Management	Map ID: 139
<p>DEERFIELD TWP (Y) Lat: 41.955560 (X) Long: -77.405694</p> <p>Debris Severity: Moderate Length: 50 ft Width: 10 ft Height: 3 ft Cubic Yards: 55.56 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Trees</p>	

Debris Management	Map ID: 140
<p>DEERFIELD TWP (Y) Lat: 41.955723 (X) Long: -77.405220</p> <p>Debris Severity: Moderate Length: 50 ft Width: 2 ft Height: 2 ft Cubic Yards: 7.41 Immediate Concern: No Suggested Action:</p> <p>Comments: Trees next to each other</p>	

Stream Restoration	Map ID: 141
<p>DEERFIELD TWP (Y) Lat: 41.955912 (X) Long: -77.404787</p> <p>Gravel Bar Severity: Moderate Length: 200 ft Width: 50 ft Height: 1.5 ft Cubic Yards: 555.56 Immediate Concern: Yes Suggested Action: Restore Channel</p> <p>Comments: Upstream as well</p>	

Stream Restoration	Map ID: 142
<p>DEERFIELD TWP (Y) Lat: 41.955942 (X) Long: -77.404212</p> <p>Gravel Bar Severity: Critical Length: 100 ft Width: 100 ft Height: 1.5 ft Cubic Yards: 555.56 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Bad bottleneck formed.</p>	

Debris Management	Map ID: 143
<p>DEERFIELD TWP (Y) Lat: 41.955955 (X) Long: -77.403791</p> <p>Debris Severity: Low Length: 6 ft Width: 2 ft Height: 2 ft Cubic Yards: 0.89 Immediate Concern: No Suggested Action:</p> <p>Comments: Car debris</p>	

Debris Management	Map ID: 144
<p>DEERFIELD TWP (Y) Lat: 41.956775 (X) Long: -77.402481</p> <p>Debris Severity: Moderate Length: 50 ft Width: 3 ft Height: 3 ft Cubic Yards: 16.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 145
<p>DEERFIELD TWP (Y) Lat: 41.957018 (X) Long: -77.402048</p> <p>Gravel Bar Severity: Moderate Length: 100 ft Width: 100 ft Height: 50 ft Cubic Yards: 18518.52 Immediate Concern: No Suggested Action:</p> <p>Comments: Trees and gravel bar.</p>	

Debris Management	Map ID: 146
<p>DEERFIELD TWP (Y) Lat: 41.957192 (X) Long: -77.401651</p> <p>Debris Severity: Low Length: 3 ft Width: 1 ft Height: 1 ft Cubic Yards: 0.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 147
<p>DEERFIELD TWP (Y) Lat: 41.957646 (X) Long: -77.400965</p> <p>Debris Severity: High Length: 10 ft Width: 10 ft Height: 1 ft Cubic Yards: 3.70 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Debris Management	Map ID: 148
<p>DEERFIELD TWP (Y) Lat: 41.957595 (X) Long: -77.400908</p> <p>Debris Severity: Critical Length: 30 ft Width: 5 ft Height: 1 ft Cubic Yards: 5.56 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Debris trailer and tires. Will get swept away in next flood.</p>	

Access Point	Map ID: 149
<p>DEERFIELD TWP (Y) Lat: 41.958086 (X) Long: -77.400247</p> <p>other Severity: Moderate Length: 5 ft Width: 5 ft Height: 5 ft Cubic Yards: 4.63 Immediate Concern: No Suggested Action:</p> <p>Comments: Access out of river.</p>	

Stream Restoration	Map ID: 150
<p>DEERFIELD TWP (Y) Lat: 41.958062 (X) Long: -77.400171</p> <p>Gravel Bar Severity: Low Length: 500 ft Width: 50 ft Height: 2 ft Cubic Yards: 1851.85 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

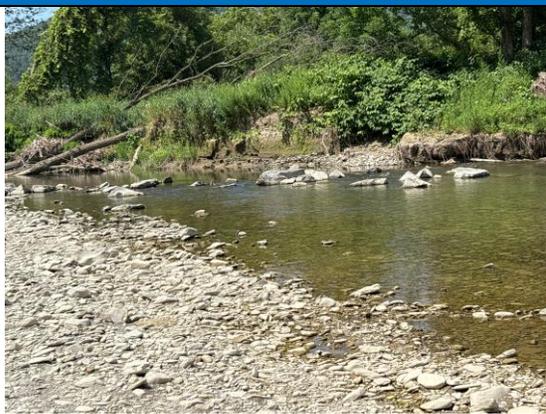
Debris Management	Map ID: 151
<p>DEERFIELD TWP (Y) Lat: 41.958820 (X) Long: -77.398397</p> <p>other Severity: Low Length: 50 ft Width: 10 ft Height: 4 ft Cubic Yards: 74.07 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 152
<p>DEERFIELD TWP (Y) Lat: 41.959002 (X) Long: -77.397996</p> <p>Debris Severity: Moderate Length: 10 ft Width: 15 ft Height: 2 ft Cubic Yards: 11.11 Immediate Concern: No Suggested Action:</p> <p>Comments: Looks like rip rap rock.</p>	

Stream Restoration	Map ID: 153
<p>DEERFIELD TWP (Y) Lat: 41.959003 (X) Long: -77.397993</p> <p>Gravel Bar Severity: Moderate Length: 100 ft Width: 25 ft Height: 1 ft Cubic Yards: 92.59 Immediate Concern: No Suggested Action:</p> <p>Comments: Rip rap.</p>	

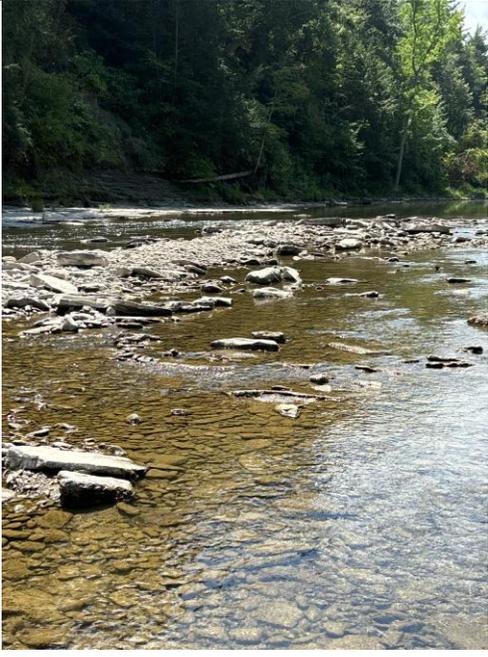
Debris Management	Map ID: 154
<p>DEERFIELD TWP (Y) Lat: 41.959433 (X) Long: -77.396896</p> <p>Debris Severity: Low Length: 30 ft Width: 10 ft Height: 3 ft Cubic Yards: 33.33 Immediate Concern: No Suggested Action:</p> <p>Comments: 2 different sections close to each other.</p>	

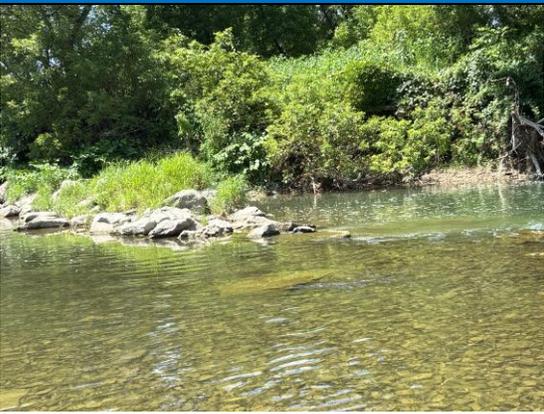
Debris Management	Map ID: 155
<p>DEERFIELD TWP (Y) Lat: 41.959403 (X) Long: -77.396344</p> <p>Debris Severity: Moderate Length: 200 ft Width: 75 ft Height: 10 ft Cubic Yards: 5555.56 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Rip rap rocks, gravel rock bar and huge fallen trees.</p>	

Bank Stabilization	Map ID: 156
<p>DEERFIELD TWP (Y) Lat: 41.959211 (X) Long: -77.394933</p> <p>Gravel Bar Severity: Moderate Length: 120 ft Width: 40 ft Height: 2 ft Cubic Yards: 355.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Shaving gravel bar and moving displaced rip rap against left bank.</p>	

Stream Restoration	Map ID: 157
<p>DEERFIELD TWP (Y) Lat: 41.958860 (X) Long: -77.394292</p> <p>Gravel Bar Severity: Moderate Length: 15 ft Width: 5 ft Height: 4 ft Cubic Yards: 11.11 Immediate Concern: No Suggested Action:</p> <p>Comments: Rearrange rocks due to then causing erosion.</p>	

Debris Management	Map ID: 158
<p>DEERFIELD TWP (Y) Lat: 41.958772 (X) Long: -77.393999</p> <p>Debris Severity: Low Length: 50 ft Width: 3 ft Height: 3 ft Cubic Yards: 16.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 159
<p>DEERFIELD TWP (Y) Lat: 41.959061 (X) Long: -77.391339</p> <p>Gravel Bar Severity: Low Length: 30 ft Width: 3 ft Height: 1 ft Cubic Yards: 3.33 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 160
<p>DEERFIELD TWP (Y) Lat: 41.964690 (X) Long: -77.382036</p> <p>other Severity: Moderate Length: 25 ft Width: 5 ft Height: 4 ft Cubic Yards: 18.52 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 161
<p>DEERFIELD TWP (Y) Lat: 41.965962 (X) Long: -77.378965</p> <p>Erosion Severity: Moderate Length: 250 ft Width: 5 ft Height: 11 ft Cubic Yards: 509.26 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 162
<p>DEERFIELD TWP (Y) Lat: 41.966103 (X) Long: -77.376533</p> <p>Gravel Bar Severity: Moderate Length: 70 ft Width: 35 ft Height: 2 ft Cubic Yards: 181.48 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 163
<p>DEERFIELD TWP (Y) Lat: 41.966965 (X) Long: -77.374455</p> <p>Erosion Severity: Moderate Length: 700 ft Width: 5 ft Height: 12 ft Cubic Yards: 1555.56 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 164
<p>DEERFIELD TWP (Y) Lat: 41.968025 (X) Long: -77.373544</p> <p>Debris Severity: Low Length: 100 ft Width: 4 ft Height: 3 ft Cubic Yards: 44.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 165
<p>DEERFIELD TWP (Y) Lat: 41.968671 (X) Long: -77.373509</p> <p>Gravel Bar Severity: Moderate Length: 200 ft Width: 90 ft Height: 5 ft Cubic Yards: 3333.33 Immediate Concern: No Suggested Action:</p> <p>Comments: Shave and shape.</p>	

Debris Management	Map ID: 166
<p>DEERFIELD TWP (Y) Lat: 41.968846 (X) Long: -77.373397</p> <p>Debris Severity: Low Length: 50 ft Width: 5 ft Height: 3 ft Cubic Yards: 27.78 Immediate Concern: No Suggested Action:</p> <p>Comments: Trees.</p>	

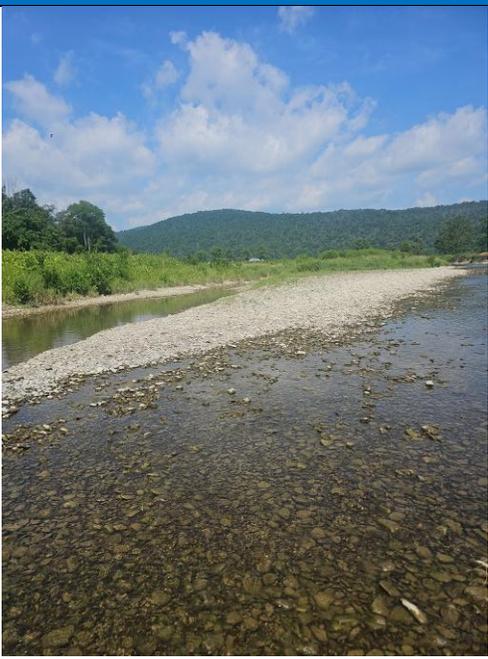
Debris Management	Map ID: 167
<p>OSCEOLA TWP (Y) Lat: 41.971249 (X) Long: -77.372597</p> <p>Gravel Bar Severity: Moderate Length: 100 ft Width: 35 ft Height: 3 ft Cubic Yards: 388.89 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Gravel bar and big trees. Homes nearby across river.</p>	

Debris Management	Map ID: 168
<p>OSCEOLA TWP (Y) Lat: 41.971250 (X) Long: -77.371714</p> <p>Debris Severity: Moderate Length: 30 ft Width: 3 ft Height: 3 ft Cubic Yards: 10.00 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 169
<p>OSCEOLA TWP (Y) Lat: 41.971195 (X) Long: -77.370616</p> <p>Gravel Bar Severity: Moderate Length: 69 ft Width: 7 ft Height: 2.5 ft Cubic Yards: 44.72 Immediate Concern: No Suggested Action:</p> <p>Comments: Little gravel bar with vegetation.</p>	

Debris Management	Map ID: 170
<p>OSCEOLA TWP (Y) Lat: 41.970692 (X) Long: -77.369360</p> <p>Debris Severity: Moderate Length: 6 ft Width: 4 ft Height: 1 ft Cubic Yards: 0.89 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Bank Stabilization	Map ID: 171
<p>OSCEOLA TWP (Y) Lat: 41.970003 (X) Long: -77.368310</p> <p>Undercut Bank Severity: Moderate Length: 200 ft Width: 3 ft Height: 10 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 172
<p>OSCEOLA TWP (Y) Lat: 41.969394 (X) Long: -77.368063</p> <p>Gravel Bar Severity: Moderate Length: 200 ft Width: 55 ft Height: 2 ft Cubic Yards: 814.81 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Bad bank undercutting as well.</p>	

Stream Restoration	Map ID: 173
<p>OSCEOLA TWP (Y) Lat: 41.969186 (X) Long: -77.366685</p> <p>Gravel Bar Severity: Moderate Length: 100 ft Width: 30 ft Height: 2 ft Cubic Yards: 222.22 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Stream Restoration	Map ID: 174
<p>OSCEOLA TWP (Y) Lat: 41.969483 (X) Long: -77.365426</p> <p>Gravel Bar Severity: Low Length: 50 ft Width: 20 ft Height: 2 ft Cubic Yards: 74.07 Immediate Concern: No Suggested Action: Restore Channel</p> <p>Comments: Middle of stream.</p>	

Access Point	Map ID: 175
<p>OSCEOLA TWP (Y) Lat: 41.969789 (X) Long: -77.364313</p> <p>other Severity: Low Length: 20 ft Width: 7 ft Height: 10 ft Cubic Yards: 51.85 Immediate Concern: No Suggested Action:</p> <p>Comments: Good access point from private land.</p>	

Debris Management	Map ID: 176
<p>OSCEOLA TWP (Y) Lat: 41.969927 (X) Long: -77.363576</p> <p>Debris Severity: Moderate Length: 70 ft Width: 15 ft Height: 5 ft Cubic Yards: 194.44 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 177
<p>OSCEOLA TWP (Y) Lat: 41.969814 (X) Long: -77.363497</p> <p>Gravel Bar Severity: Moderate Length: 150 ft Width: 40 ft Height: 2 ft Cubic Yards: 444.44 Immediate Concern: No Suggested Action:</p> <p>Comments: Middle of stream.</p>	

Debris Management	Map ID: 178
<p>OSCEOLA TWP (Y) Lat: 41.970026 (X) Long: -77.362161</p> <p>Debris Severity: Moderate Length: 50 ft Width: 2 ft Height: 2 ft Cubic Yards: 7.41 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 179
<p>OSCEOLA TWP (Y) Lat: 41.970076 (X) Long: -77.361094</p> <p>Debris Severity: High Length: 72 ft Width: 8 ft Height: 7 ft Cubic Yards: 149.33 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Big tree. Affects channel.</p>	

Stream Restoration	Map ID: 180
<p>OSCEOLA TWP (Y) Lat: 41.969817 (X) Long: -77.360550</p> <p>Gravel Bar Severity: Low Length: 200 ft Width: 20 ft Height: 2 ft Cubic Yards: 296.30 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 181
<p>OSCEOLA TWP (Y) Lat: 41.970302 (X) Long: -77.357593</p> <p>Gravel Bar Severity: Low Length: 200 ft Width: 30 ft Height: 1 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 182
<p>OSCEOLA TWP (Y) Lat: 41.970373 (X) Long: -77.357115</p> <p>Debris Severity: Moderate Length: 50 ft Width: 5 ft Height: 2.5 ft Cubic Yards: 23.15 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Big tree. Could float down river and affect bridge.</p>	

Stream Restoration	Map ID: 183
<p>OSCEOLA TWP (Y) Lat: 41.971169 (X) Long: -77.355161</p> <p>Gravel Bar Severity: Low Length: 200 ft Width: 30 ft Height: 1 ft Cubic Yards: 222.22 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 184
<p>OSCEOLA TWP (Y) Lat: 41.971512 (X) Long: -77.354308</p> <p>Debris Severity: Low Length: 50 ft Width: 1 ft Height: 1 ft Cubic Yards: 1.85 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 185
<p>OSCEOLA TWP (Y) Lat: 41.971676 (X) Long: -77.353706</p> <p>Vegetation Encroachment Severity: High Length: 300 ft Width: 100 ft Height: 2 ft Cubic Yards: 2222.22 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Vegetation on gravel bar.</p>	

Stream Restoration	Map ID: 186
<p>OSCEOLA TWP (Y) Lat: 41.972150 (X) Long: -77.352599</p> <p>Gravel Bar Severity: Moderate Length: 200 ft Width: 40 ft Height: 2 ft Cubic Yards: 592.59 Immediate Concern: No Suggested Action: Restore Channel</p> <p>Comments:</p>	

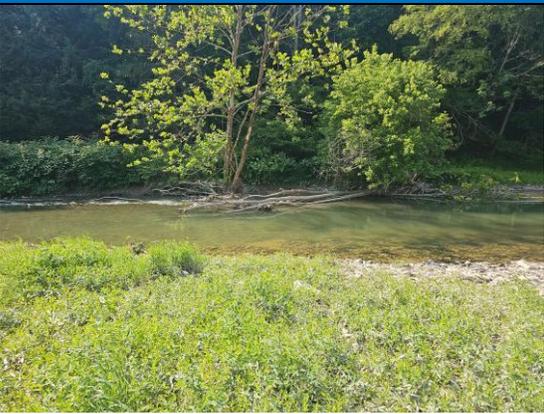
Debris Management	Map ID: 187
<p>OSCEOLA TWP (Y) Lat: 41.972332 (X) Long: -77.351990</p> <p>Debris Severity: Moderate Length: 30 ft Width: 5 ft Height: 4 ft Cubic Yards: 22.22 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Could float down river and cause problems.</p>	

Bank Stabilization	Map ID: 188
<p>OSCEOLA TWP (Y) Lat: 41.972744 (X) Long: -77.350840</p> <p>Undercut Bank Severity: High Length: 500 ft Width: 10 ft Height: 8 ft Cubic Yards: 1481.48 Immediate Concern: Yes Suggested Action: Stabilize Bank</p> <p>Comments: Severe undercut.</p>	

Debris Management	Map ID: 189
<p>OSCEOLA TWP (Y) Lat: 41.972105 (X) Long: -77.350415</p> <p>Debris Severity: Moderate Length: 50 ft Width: 20 ft Height: 4 ft Cubic Yards: 148.15 Immediate Concern: No Suggested Action:</p> <p>Comments: Center where large gravel bar splits stream.</p>	

Stream Restoration	Map ID: 190
<p>OSCEOLA TWP (Y) Lat: 41.972650 (X) Long: -77.349446</p> <p>Gravel Bar Severity: High Length: 200 ft Width: 75 ft Height: 2 ft Cubic Yards: 1111.11 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Two gravel bars.</p>	

Debris Management	Map ID: 191
<p>OSCEOLA TWP (Y) Lat: 41.972697 (X) Long: -77.348749</p> <p>Debris Severity: Moderate Length: 60 ft Width: 10 ft Height: 5 ft Cubic Yards: 111.11 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Debris Management	Map ID: 192
<p>OSCEOLA TWP (Y) Lat: 41.973368 (X) Long: -77.347561</p> <p>Debris Severity: High Length: 10 ft Width: 10 ft Height: 3 ft Cubic Yards: 11.11 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Long tree in stream.</p>	

Debris Management	Map ID: 193
<p>OSCEOLA TWP (Y) Lat: 41.973631 (X) Long: -77.346900</p> <p>Debris Severity: Moderate Length: 40 ft Width: 10 ft Height: 2 ft Cubic Yards: 29.63 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 194
<p>OSCEOLA TWP (Y) Lat: 41.973950 (X) Long: -77.347044</p> <p>Gravel Bar Severity: High Length: 350 ft Width: 200 ft Height: 3 ft Cubic Yards: 7777.78 Immediate Concern: Yes Suggested Action: Restore Channel</p> <p>Comments: Second part of huge gravel bar.</p>	

Debris Management	Map ID: 195
<p>OSCEOLA TWP (Y) Lat: 41.973911 (X) Long: -77.346557</p> <p>Debris Severity: Low Length: 10 ft Width: 1 ft Height: 1 ft Cubic Yards: 0.37 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 196
<p>OSCEOLA TWP (Y) Lat: 41.974218 (X) Long: -77.346140</p> <p>Gravel Bar Severity: High Length: 68 ft Width: 250 ft Height: 2.5 ft Cubic Yards: 1574.07 Immediate Concern: Yes Suggested Action: Restore Channel</p> <p>Comments: Big island gravel bar.</p>	

Stream Restoration	Map ID: 197
<p>OSCEOLA TWP (Y) Lat: 41.974289 (X) Long: -77.346046</p> <p>Gravel Bar Severity: Low Length: 15 ft Width: 10 ft Height: 1 ft Cubic Yards: 5.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Center of stream</p>	

Stream Restoration	Map ID: 198
<p>OSCEOLA TWP (Y) Lat: 41.974564 (X) Long: -77.345582</p> <p>Gravel Bar Severity: Low Length: 30 ft Width: 13 ft Height: 1 ft Cubic Yards: 14.44 Immediate Concern: No Suggested Action:</p> <p>Comments: Small gravel bar.</p>	

Debris Management	Map ID: 199
<p>OSCEOLA TWP (Y) Lat: 41.974753 (X) Long: -77.345272</p> <p>Debris Severity: Moderate Length: 40 ft Width: 5 ft Height: 2 ft Cubic Yards: 14.81 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 200
<p>OSCEOLA TWP (Y) Lat: 41.976603 (X) Long: -77.345149</p> <p>Gravel Bar Severity: Low Length: 1000 ft Width: 15 ft Height: 1 ft Cubic Yards: 555.56 Immediate Concern: No Suggested Action:</p> <p>Comments: Long gravel bar on right side of stream.</p>	

Stream Restoration	Map ID: 201
<p>OSCEOLA TWP (Y) Lat: 41.977404 (X) Long: -77.346033</p> <p>Gravel Bar Severity: Low Length: 69 ft Width: 21 ft Height: 1 ft Cubic Yards: 53.67 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 202
<p>OSCEOLA TWP (Y) Lat: 41.977568 (X) Long: -77.346656</p> <p>Debris Severity: High Length: 50 ft Width: 1 ft Height: 1 ft Cubic Yards: 1.85 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: One tree on right bank and one middle of stream.</p>	

Stream Restoration	Map ID: 203
<p>OSCEOLA TWP (Y) Lat: 41.978030 (X) Long: -77.347010</p> <p>Gravel Bar Severity: Moderate Length: 68 ft Width: 22 ft Height: 2 ft Cubic Yards: 110.81 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Debris Management	Map ID: 204
<p>OSCEOLA TWP (Y) Lat: 41.979047 (X) Long: -77.347526</p> <p>Debris Severity: Moderate Length: 40 ft Width: 2 ft Height: 2 ft Cubic Yards: 5.93 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments:</p>	

Stream Restoration	Map ID: 205
<p>OSCEOLA TWP (Y) Lat: 41.978991 (X) Long: -77.347275</p> <p>Gravel Bar Severity: High Length: 51 ft Width: 62 ft Height: 2.7000000000000002 ft Cubic Yards: 316.20 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Bad gravel bar.</p>	

Debris Management	Map ID: 206
<p>OSCEOLA TWP (Y) Lat: 41.979066 (X) Long: -77.347073</p> <p>Debris Severity: High Length: 77 ft Width: 13 ft Height: 2 ft Cubic Yards: 74.15 Immediate Concern: Yes Suggested Action:</p> <p>Comments: Tree and gravel.</p>	

Debris Management	Map ID: 207
<p>OSCEOLA TWP (Y) Lat: 41.979210 (X) Long: -77.346604</p> <p>Debris Severity: Low Length: 50 ft Width: 1 ft Height: 1 ft Cubic Yards: 1.85 Immediate Concern: No Suggested Action:</p> <p>Comments: Downed trees.</p>	

Stream Restoration	Map ID: 208
<p>OSCEOLA TWP (Y) Lat: 41.979423 (X) Long: -77.345976</p> <p>Gravel Bar Severity: Low Length: 50 ft Width: 10 ft Height: 0.5 ft Cubic Yards: 9.26 Immediate Concern: No Suggested Action: Restore Channel</p> <p>Comments:</p>	

Stream Restoration	Map ID: 209
<p>OSCEOLA TWP (Y) Lat: 41.979931 (X) Long: -77.345037</p> <p>Gravel Bar Severity: Low Length: 100 ft Width: 30 ft Height: 1 ft Cubic Yards: 111.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 210
<p>OSCEOLA TWP (Y) Lat: 41.980207 (X) Long: -77.343838</p> <p>Gravel Bar Severity: Low Length: 150 ft Width: 20 ft Height: 1 ft Cubic Yards: 111.11 Immediate Concern: No Suggested Action:</p> <p>Comments:</p>	

Stream Restoration	Map ID: 211
<p>OSCEOLA TWP (Y) Lat: 41.980503 (X) Long: -77.343549</p> <p>Gravel Bar Severity: Moderate Length: 30 ft Width: 20 ft Height: 2 ft Cubic Yards: 44.44 Immediate Concern: No Suggested Action:</p> <p>Comments: Gravel bar built up where tributary enters stream.</p>	

Debris Management	Map ID: 212
<p>OSCEOLA TWP (Y) Lat: 41.980867 (X) Long: -77.343619</p> <p>Debris Severity: High Length: 200 ft Width: 17 ft Height: 2 ft Cubic Yards: 251.85 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Significant debris upsteam in tributary.</p>	

Debris Management	Map ID: 213
<p>OSCEOLA TWP (Y) Lat: 41.980554 (X) Long: -77.343438</p> <p>Debris Severity: Moderate Length: 100 ft Width: 25 ft Height: 2.5 ft Cubic Yards: 231.48 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Other side of bridge.</p>	

Debris Management	Map ID: 214
<p>OSCEOLA TWP (Y) Lat: 41.980549 (X) Long: -77.342969</p> <p>Debris Severity: Moderate Length: 100 ft Width: 25 ft Height: 2.5 ft Cubic Yards: 231.48 Immediate Concern: Yes Suggested Action: Remove Debris</p> <p>Comments: Affecting bridge on right side.</p>	



Section 9

Project Locations

Tabular Data

Map ID	Project	Feature Type	Municipality	Severity	Notes
1	Bank Stabilization	Erosion	WESTFIELD TWP	Moderate	Eroding to within 20 feet of state road.
2	Debris Management	Infrastructure Risk	WESTFIELD TWP	High	Total 80 lineal feet of 1 foot diameter trees plus smaller limbs and a large root ball about 120 feet upstream from a small state road bridge.
3	Debris Management	Vegetation Encroachment	WESTFIELD TWP	Low	Medium size tree overhanging stream with other wood debris piled behind it.
4	Bank Stabilization	Undercut Bank	WESTFIELD TWP	Moderate	Undercut to lawn with wooded debris that will encourage more erosion.
5	Debris Management	Debris	WESTFIELD TWP	Moderate	Debris against pier of private bridge.
6	Infrastructure Protection	Infrastructure Risk	WESTFIELD TWP	Moderate	Debris stuck on bridge.
7	Infrastructure Protection	Gravel Bar	WESTFIELD TWP	Moderate	South bank.
8	Debris Management	Debris	WESTFIELD TWP	High	Revisit with plan of access. Not too far from the bridge and an industrial plant.
9	Infrastructure Protection	Vegetation Encroachment	WESTFIELD TWP	Moderate	Vegetation and rocks.
10	Debris Management	Debris	WESTFIELD TWP	High	Large tree stump near homes and bridge. Homes would be affected in flooding. Tributary flows into river.
11	Debris Management	Vegetation Encroachment	WESTFIELD TWP	High	Bottomneck.
12	Bank Stabilization	Undercut Bank	WESTFIELD TWP	Moderate	Bank is about plus 10 ft high. Piping exposed. Bank could collapse on pipe.
13	Debris Management	Debris	WESTFIELD TWP	Moderate	Large tree stump near bridge. Significant debris along bank.
14	Infrastructure Protection	Gravel Bar	WESTFIELD TWP	High	Under bridge, severe. Near homes and barns.
15	Infrastructure Protection	Gravel Bar	WESTFIELD TWP	High	Center below bridge. Threatening bridge infrastructure.
16	Bank Stabilization	Undercut Bank	WESTFIELD TWP	High	Bad cut. Near bridge.
17	Bank Stabilization	Undercut Bank	WESTFIELD TWP	High	Bad cut and debris.
18	Stream Restoration	Gravel Bar	WESTFIELD TWP	High	
19	Stream Restoration	Gravel Bar	WESTFIELD TWP	High	
20	Stream Restoration	Gravel Bar	WESTFIELD TWP	High	Bad section.
21	Debris Management	Debris	WESTFIELD TWP	High	Tree picture and bank erosion. Near a bridge, homes, and school nearby.
22	Stream Restoration	Gravel Bar	WESTFIELD TWP	High	Tributary.
23	Bank Stabilization	Undercut Bank	WESTFIELD TWP	High	
24	Stream Restoration	Gravel Bar	WESTFIELD TWP	Moderate	Gravel bar chance brook.
25	Bank Stabilization	Erosion	WESTFIELD TWP	Moderate	
26	Bank Stabilization	Erosion	WESTFIELD TWP	Low	
27	Debris Management	Debris	WESTFIELD TWP	Low	
28	Bank Stabilization	Undercut Bank	WESTFIELD TWP	Low	No threat to homes.
29	Debris Management	Debris	WESTFIELD TWP	Low	
30	Debris Management	Debris	WESTFIELD TWP	Moderate	
31	Debris Management	Debris	WESTFIELD TWP	Low	
32	Bank Stabilization	Erosion	WESTFIELD TWP	Moderate	Houses next to creek with erosion.
33	Debris Management	Debris	WESTFIELD TWP	Moderate	
34	Debris Management	Debris	WESTFIELD TWP	Moderate	
35	Debris Management	Debris	WESTFIELD TWP	Moderate	
36	Debris Management	Debris	WESTFIELD TWP	Low	
37	Debris Management	Debris	WESTFIELD TWP	Moderate	
38	Debris Management	Gravel Bar	WESTFIELD TWP	Moderate	Confluence of North Fork.
39	Debris Management	Debris	WESTFIELD TWP	Moderate	
40	Debris Management	Debris	WESTFIELD BORO	Moderate	Across entire stream.
41	Debris Management	Debris	WESTFIELD BORO	Low	
42	Bank Stabilization	Erosion	WESTFIELD BORO	Moderate	Close to guide railroad.
43	Debris Management	Debris	WESTFIELD BORO	Low	
44	Debris Management	Debris	WESTFIELD BORO	Low	
45	Debris Management	Debris	WESTFIELD BORO	Low	
46	Bank Stabilization	Erosion	WESTFIELD BORO	Moderate	Behind park. Some rip rap at west end.
47	Debris Management	Debris	WESTFIELD BORO	Low	
48	Bank Stabilization	Erosion	WESTFIELD BORO	Moderate	
49	Debris Management	Debris	WESTFIELD BORO	Low	
50	Bank Stabilization	Erosion	WESTFIELD BORO	Low	
51	Debris Management	Debris	WESTFIELD BORO	Low	Scrap Metal.
52	Debris Management	Debris	WESTFIELD BORO	Low	Scrap Metal.
53	Infrastructure Protection	Infrastructure Risk	WESTFIELD BORO	High	Exposed 12 inch steel pipe.
54	Bank Stabilization	Erosion	WESTFIELD BORO	Moderate	
55	Stream Restoration	Gravel Bar	WESTFIELD BORO	Low	Flooding threat to Tier II Facility.
56	Bank Stabilization	Erosion	WESTFIELD BORO	Moderate	
57	Debris Management	Debris	WESTFIELD BORO	High	

Map ID	Project	Feature Type	Municipality	Severity	Notes
58	Bank Stabilization	Erosion	WESTFIELD TWP	Moderate	Behind occupied buildings.
59	Debris Management	Debris	WESTFIELD TWP	Low	Portion of boat.
60	Bank Stabilization	Undercut Bank	WESTFIELD TWP	High	
61	Debris Management	Debris	WESTFIELD TWP	Moderate	
62	Bank Stabilization	Undercut Bank	WESTFIELD TWP	High	
63	Bank Stabilization	Undercut Bank	WESTFIELD TWP	High	
64	Bank Stabilization	Erosion	WESTFIELD TWP	Moderate	
65	Debris Management	Debris	WESTFIELD TWP	Low	
66	Debris Management	Debris	WESTFIELD TWP	Low	
67	Debris Management	Debris	WESTFIELD TWP	Moderate	
68	Bank Stabilization	Erosion	WESTFIELD TWP	High	
69	Debris Management	Debris	WESTFIELD TWP	Low	
70	Debris Management	Debris	WESTFIELD TWP	Moderate	
71	Bank Stabilization	Erosion	WESTFIELD TWP	High	Beginning for distance.
72	Bank Stabilization	Erosion	WESTFIELD TWP	High	Mid point capture for distance.
73	Bank Stabilization	Erosion	WESTFIELD TWP	High	End point for erosion.
74	Debris Management	Debris	WESTFIELD TWP	Low	
75	Bank Stabilization	Erosion	WESTFIELD TWP	Low	
76	Debris Management	Debris	WESTFIELD TWP	High	
77	Debris Management	Debris	WESTFIELD TWP	Moderate	
78	Debris Management	Gravel Bar	WESTFIELD TWP	Moderate	Long view.
79	Debris Management	Debris	WESTFIELD TWP	Moderate	Tree and rock. Homes nearby.
80	Debris Management	Debris	WESTFIELD TWP	Moderate	Debris car bumper.
81	Debris Management	Debris	WESTFIELD TWP	Low	
82	Stream Restoration	Gravel Bar	WESTFIELD TWP	Moderate	Deep water rot much access. Near homes and bridge.
83	Debris Management	Gravel Bar	WESTFIELD TWP	High	Debris also present, huge tree down. Near bridge and homes.
84	Debris Management	Gravel Bar	WESTFIELD TWP	High	Long gravel bar looking both ways. Confluence of Purple Brook.
85	Debris Management	Debris	WESTFIELD TWP	Moderate	Gravel bar drastically affecting course of river.
86	Stream Restoration	Gravel Bar	WESTFIELD TWP	Moderate	South bank. Homes not far from river bank.
87	Debris Management	Debris	WESTFIELD TWP	Low	
88	Debris Management	Debris	WESTFIELD TWP	Moderate	
89	Debris Management	Debris	WESTFIELD TWP	Moderate	
90	Infrastructure Protection	Infrastructure Risk	WESTFIELD TWP	High	8 inch steel pipe exposed crossing river.
91	Debris Management	Debris	DEERFIELD TWP	Low	
92	Debris Management	Debris	DEERFIELD TWP	Moderate	
93	Debris Management	Debris	DEERFIELD TWP	Low	
94	Debris Management	Debris	DEERFIELD TWP	Low	
95	Debris Management	Debris	DEERFIELD TWP	Moderate	
96	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	Possible yearly maintenance already being done.
97	Debris Management	Debris	DEERFIELD TWP	High	Debris and gravel bar.
98	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	Sawtooth through the trees not the whole length.
99	Bank Stabilization	Undercut Bank	DEERFIELD TWP	Low	Erosion and undercutting.
100	Debris Management	Debris	DEERFIELD TWP	Low	
101	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	Potential gravel bar removal for flood relief. Need engineer.
102	Bank Stabilization	Erosion	DEERFIELD TWP	High	May already be an NCRS project.
103	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	Lower gravel bar for flood relief channel. Maintenance.
104	Debris Management	Debris	DEERFIELD TWP	Low	
105	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	
106	Debris Management	Debris	DEERFIELD TWP	Low	
107	Bank Stabilization	Erosion	DEERFIELD TWP	Low	Field behind.
108	Debris Management	Debris	DEERFIELD TWP	High	Tree with root ball and woody debris.
109	Bank Stabilization	Erosion	DEERFIELD TWP	High	Erosion and sloping major. Homes extremely close.
110	Debris Management	Gravel Bar	DEERFIELD TWP	High	Possibly already permitted work and maybe not complete. Confluence of Troups Creek.
111	Stream Restoration	other	DEERFIELD TWP	Low	
112	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	
113	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	Sharp s curve in river impacts road.
114	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	Water cuts over on wrong side of bank and floods down to homes.

Map ID	Project	Feature Type	Municipality	Severity	Notes
115	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	Behind homes. Too deep to walk full length for pictures.
116	Debris Management	Debris	DEERFIELD TWP	Moderate	Middle of river.
117	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	
118	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	
119	Stream Restoration	other	DEERFIELD TWP	Low	
120	Debris Management	Debris	DEERFIELD TWP	Low	Woody debris plus.
121	Debris Management	Debris	DEERFIELD TWP	Low	Woody debris and boat on bank.
122	Debris Management	Debris	DEERFIELD TWP	Low	Tree debris.
123	Bank Stabilization	Erosion	DEERFIELD TWP	Low	Erosion exposing possible farm dump.
124	Debris Management	Debris	DEERFIELD TWP	High	Tree
125	Infrastructure Protection	Gravel Bar	DEERFIELD TWP	Moderate	Center under bridge
126	Debris Management	Gravel Bar	DEERFIELD TWP	High	Trees and debris. Near bridge.
127	Debris Management	Debris	DEERFIELD TWP	Moderate	Tree. Near bridge and pipeline valve. Previous points also near valve.
128	Bank Stabilization	Undercut Bank	DEERFIELD TWP	Moderate	
129	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	
130	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	
131	Debris Management	Debris	DEERFIELD TWP	Moderate	Tree and debris
132	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	
133	Debris Management	Debris	DEERFIELD TWP	Moderate	Trees on both sides of bank.
134	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	Center of stream
135	Stream Restoration	Gravel Bar	DEERFIELD TWP	High	Gravel bars on both sides of the river. Confluence of Yamell Brook
136	Debris Management	Debris	DEERFIELD TWP	Moderate	
137	Debris Management	Debris	DEERFIELD TWP	Moderate	Rocks
138	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	
139	Debris Management	Debris	DEERFIELD TWP	Moderate	Trees
140	Debris Management	Debris	DEERFIELD TWP	Moderate	Trees next to each other
141	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	Upstream as well
142	Stream Restoration	Gravel Bar	DEERFIELD TWP	Critical	Bad bottleneck formed.
143	Debris Management	Debris	DEERFIELD TWP	Low	Car debris
144	Debris Management	Debris	DEERFIELD TWP	Moderate	
145	Debris Management	Gravel Bar	DEERFIELD TWP	Moderate	Trees and gravel bar.
146	Debris Management	Debris	DEERFIELD TWP	Low	
147	Debris Management	Debris	DEERFIELD TWP	High	
148	Debris Management	Debris	DEERFIELD TWP	Critical	Debris trailer and tires. Will get swept away in next flood.
149	Access Point	other	DEERFIELD TWP	Moderate	Access out of river.
150	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	
151	Debris Management	other	DEERFIELD TWP	Low	
152	Debris Management	Debris	DEERFIELD TWP	Moderate	Looks like rip rap rock.
153	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	Rip rap.
154	Debris Management	Debris	DEERFIELD TWP	Low	2 different sections close to each other.
155	Debris Management	Debris	DEERFIELD TWP	Moderate	Rip rap rocks, gravel rock bar and huge fallen trees.
156	Bank Stabilization	Gravel Bar	DEERFIELD TWP	Moderate	Shaving gravel bar and moving displaced rip rap against left bank.
157	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	Rearrange rocks due to them causing erosion.
158	Debris Management	Debris	DEERFIELD TWP	Low	
159	Stream Restoration	Gravel Bar	DEERFIELD TWP	Low	
160	Bank Stabilization	other	DEERFIELD TWP	Moderate	
161	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	
162	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	
163	Bank Stabilization	Erosion	DEERFIELD TWP	Moderate	
164	Debris Management	Debris	DEERFIELD TWP	Low	
165	Stream Restoration	Gravel Bar	DEERFIELD TWP	Moderate	Shave and shape.
166	Debris Management	Debris	DEERFIELD TWP	Low	Trees.
167	Debris Management	Gravel Bar	OSCEOLA TWP	Moderate	Gravel bar and big trees. Homes nearby across river.
168	Debris Management	Debris	OSCEOLA TWP	Moderate	
169	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	Little gravel bar with vegetation.
170	Debris Management	Debris	OSCEOLA TWP	Moderate	
171	Bank Stabilization	Undercut Bank	OSCEOLA TWP	Moderate	

Map ID	Project	Feature Type	Municipality	Severity	Notes
172	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	Bad bank undercutting as well.
173	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	
174	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	Middle of stream.
175	Access Point	Other	OSCEOLA TWP	Low	Good access point from private land.
176	Debris Management	Debris	OSCEOLA TWP	Moderate	
177	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	Middle of stream.
178	Debris Management	Debris	OSCEOLA TWP	Moderate	
179	Debris Management	Debris	OSCEOLA TWP	Moderate	
180	Stream Restoration	Gravel Bar	OSCEOLA TWP	High	Big tree. Affects channel.
181	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	
182	Debris Management	Debris	OSCEOLA TWP	Low	
183	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	Big tree. Could float down river and affect bridge.
184	Debris Management	Debris	OSCEOLA TWP	Low	
185	Debris Management	Vegetation Encroachment	OSCEOLA TWP	High	Vegetation on gravel bar.
186	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	
187	Debris Management	Debris	OSCEOLA TWP	Moderate	Could float down river and cause problems.
188	Bank Stabilization	Undercut Bank	OSCEOLA TWP	High	Severe undercut.
189	Debris Management	Debris	OSCEOLA TWP	Moderate	Center where large gravel bar spills stream.
190	Stream Restoration	Gravel Bar	OSCEOLA TWP	High	Two gravel bars.
191	Debris Management	Debris	OSCEOLA TWP	Moderate	
192	Debris Management	Debris	OSCEOLA TWP	High	Long tree in stream.
193	Debris Management	Debris	OSCEOLA TWP	Moderate	
194	Stream Restoration	Gravel Bar	OSCEOLA TWP	High	Second part of huge gravel bar.
195	Debris Management	Debris	OSCEOLA TWP	Low	
196	Stream Restoration	Gravel Bar	OSCEOLA TWP	High	Big island gravel bar.
197	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	Center of stream
198	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	Small gravel bar.
199	Debris Management	Debris	OSCEOLA TWP	Moderate	
200	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	Long gravel bar on right side of stream.
201	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	
202	Debris Management	Debris	OSCEOLA TWP	High	One tree on right bank and one middle of stream.
203	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	
204	Debris Management	Debris	OSCEOLA TWP	Moderate	
205	Stream Restoration	Gravel Bar	OSCEOLA TWP	High	Bad gravel bar.
206	Debris Management	Debris	OSCEOLA TWP	High	Tree and gravel.
207	Debris Management	Debris	OSCEOLA TWP	Low	Downed trees.
208	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	
209	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	
210	Stream Restoration	Gravel Bar	OSCEOLA TWP	Low	
211	Stream Restoration	Gravel Bar	OSCEOLA TWP	Moderate	Gravel bar built up where tributary enters stream.
212	Debris Management	Debris	OSCEOLA TWP	High	Significant debris upstream in tributary.
213	Debris Management	Debris	OSCEOLA TWP	Moderate	Other side of bridge.
214	Debris Management	Debris	OSCEOLA TWP	Moderate	Affecting bridge on right side.



Section 10

Project Locations

Map Inserts



Legend

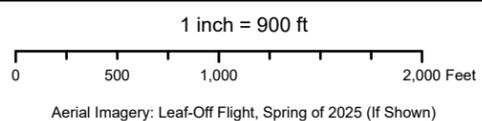
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- Erosion
- Gravel Bar
- Infrastructure Risk
- Undercut Bank
- Vegetation Encroachment
- Other

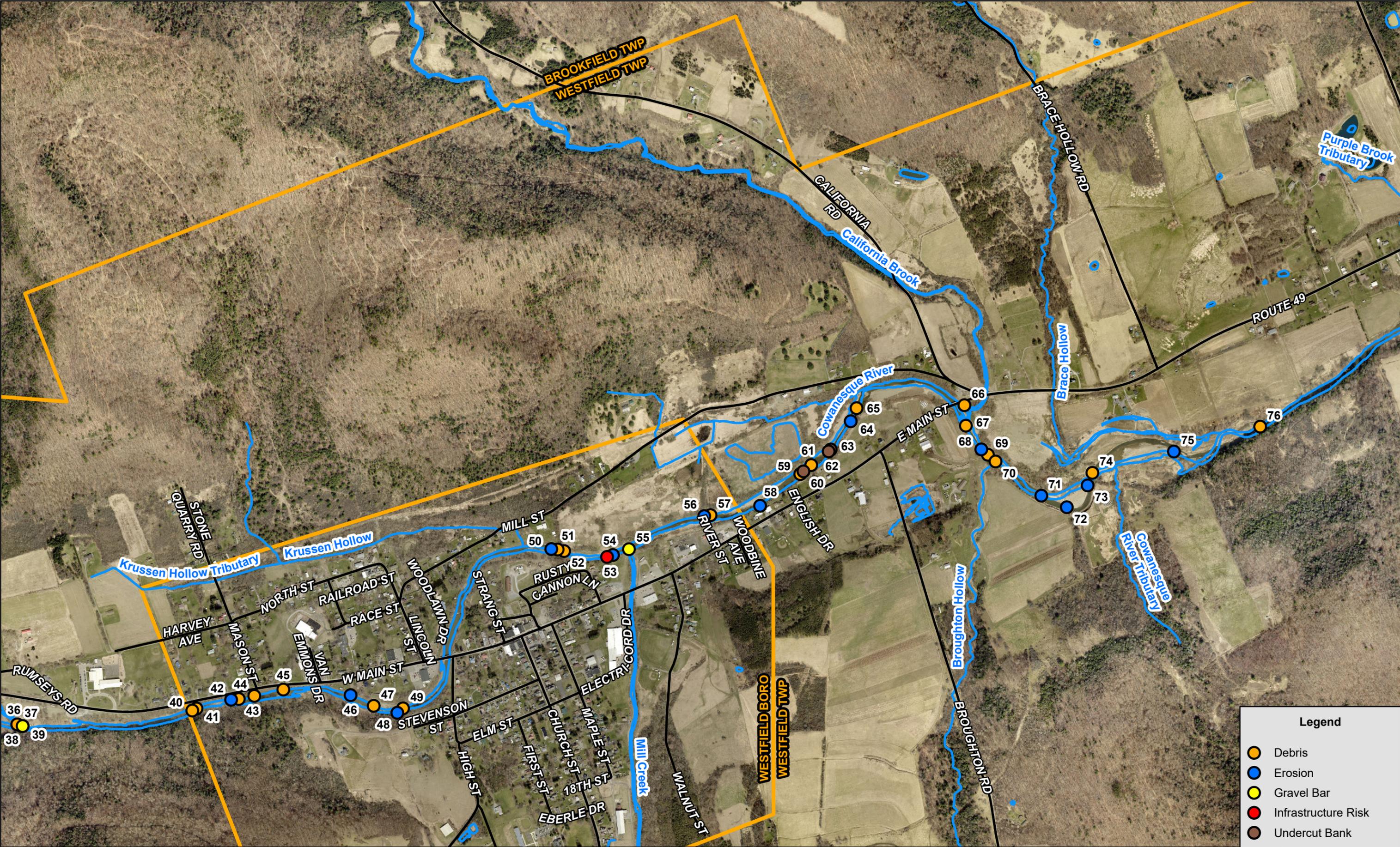
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Debris Area
 Map Created: 8/21/2025
 Map ID 1-39

Created by: Tioga County (PA) GIS Dept.





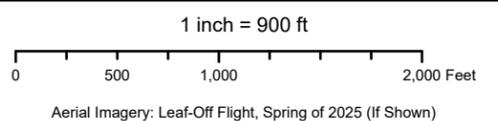
Legend

- Debris
- Erosion
- Gravel Bar
- Infrastructure Risk
- Undercut Bank
- Vegetation Encroachment
- Other

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Debris Area
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 Map ID 36-76
 Created by: Tioga County (PA) GIS Dept.

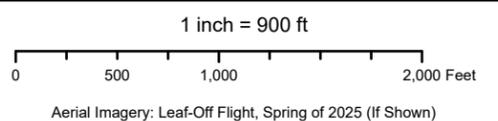




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Debris Area
Map Created: 8/21/2025
Map ID 76-92
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Legend

- Debris
- Erosion
- Gravel Bar
- Infrastructure Risk
- Undercut Bank
- Vegetation Encroachment
- Other



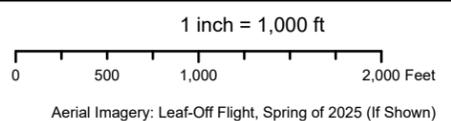
Legend

- Debris
- Erosion
- Gravel Bar
- Infrastructure Risk
- Undercut Bank
- Vegetation Encroachment
- Other

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Debris Area
 Map Created: 8/21/2025
 Map ID 91-125
 Created by: Tioga County (PA) GIS Dept.

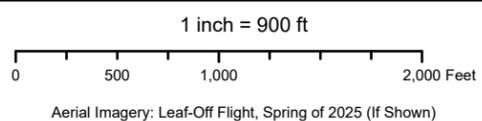




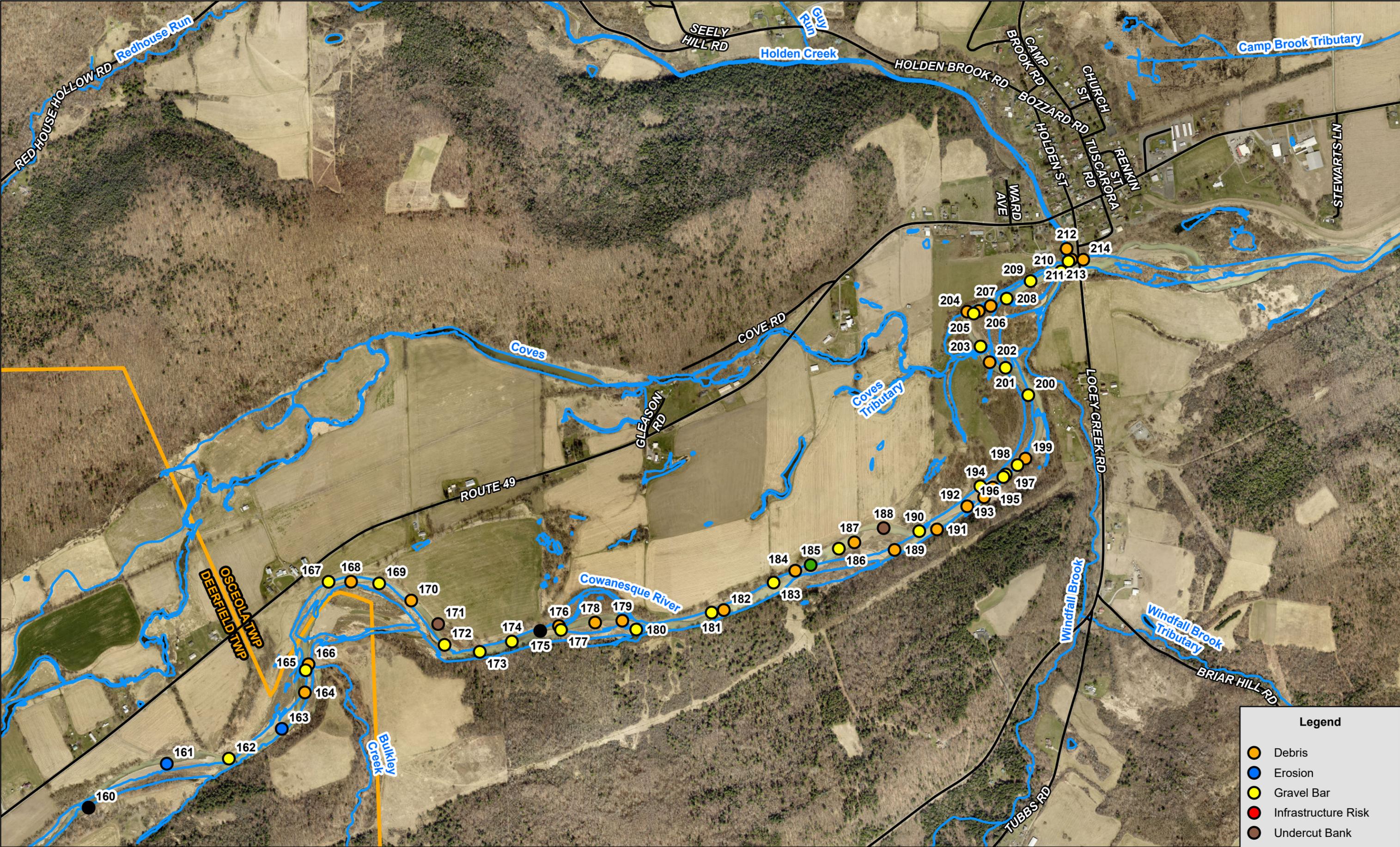
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Debris Area
Map Created: 8/21/2025
Map ID 125-173
 Created by: Tioga County (PA) GIS Dept.



Legend	
	Debris
	Erosion
	Gravel Bar
	Infrastructure Risk
	Undercut Bank
	Vegetation Encroachment
	Other



Legend

- Debris
- Erosion
- Gravel Bar
- Infrastructure Risk
- Undercut Bank
- Vegetation Encroachment
- Other

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Debris Area
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Map ID 160-214
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