

# HRG

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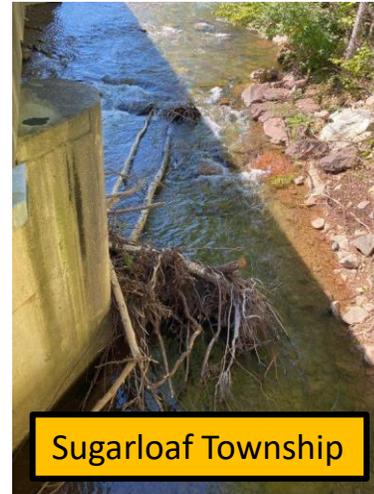
AN EMPLOYEE-OWNED COMPANY



# Fishing Creek Watershed Flooding Assessment and Mitigation Study



Orange Township



Sugarloaf Township



Greenwood Township



This project has been financed by grants from the Commonwealth of Pennsylvania, Commonwealth Financing Authority and the Department of Community and Economic Development.

March 31, 2022

# Agenda

- > *Project Team*
- > *Watershed Study Area Outline & Goals*
- > *Draft Findings:*
  - *Problem Area Identification*
  - *Study Areas/Subwatersheds*
  - *Proposed Mitigation Measures*
- > *Next Steps*
- > *Break to Open House for Comments/Questions*

# Project Team

**Eric Stahley**  
Resiliency Officer



**Teri Provost, CFM**  
Director, Flood Resiliency

**Geralee Zeigler**  
Flood Resiliency Program Analyst



**Erin Threet, PE**  
Assistant Vice President  
Client Manager

**Matt Vanaskie, PE**  
Project Manager  
Water Resources Engineer

**Scott Smith, PE**  
Project Engineer  
Site Investigation/Assessment Lead

**Isaac Underhill, EIT**  
Project Engineer  
Technical Analysis

**Kaitlin Mills**  
Project Planner  
Ordinance Review

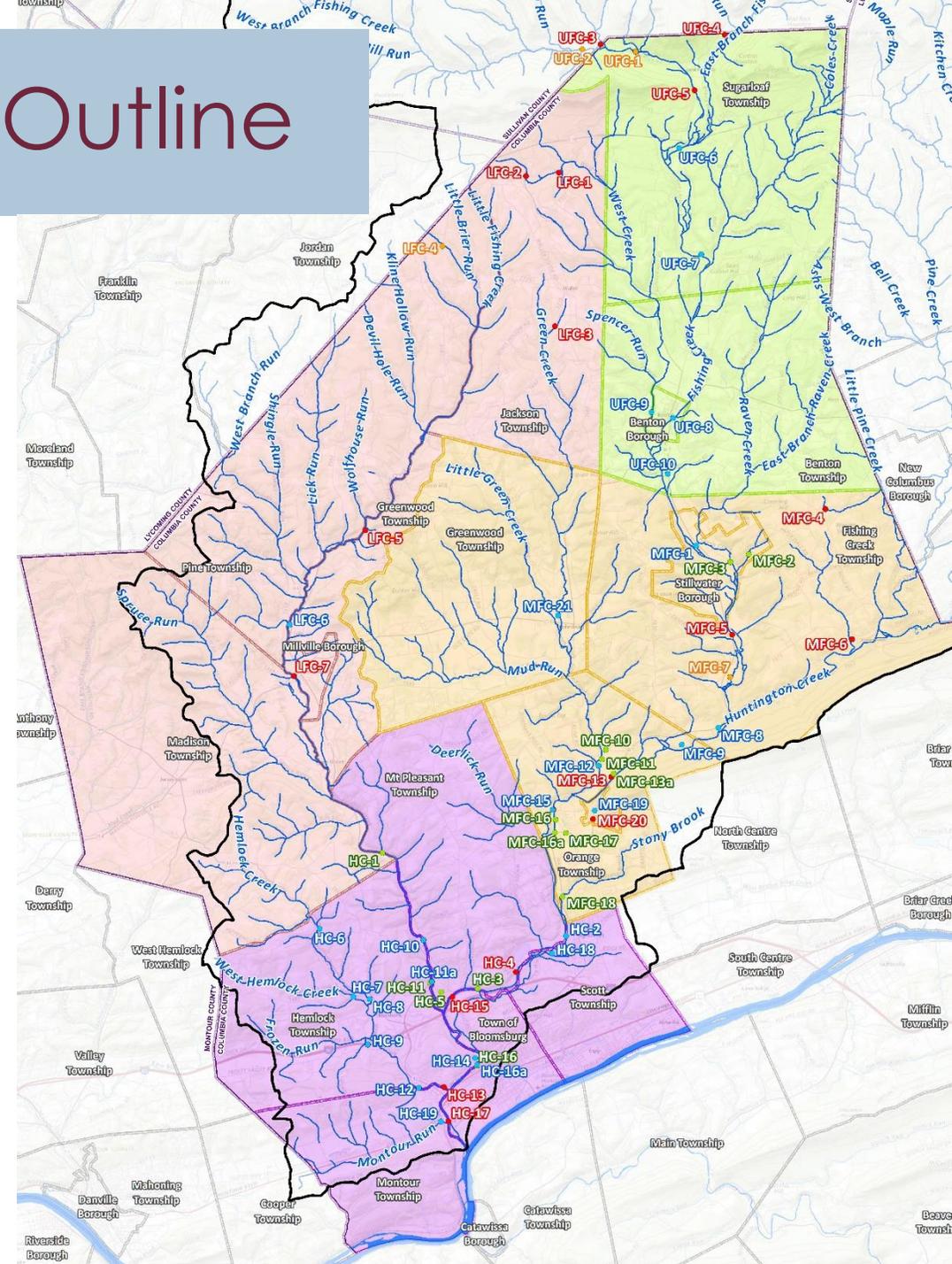
**David Pyle**  
Project Engineer  
Site Investigations

**Coordination with West End Flood Study Project Team (Borton-Lawson)**

# Watershed Study Area Outline

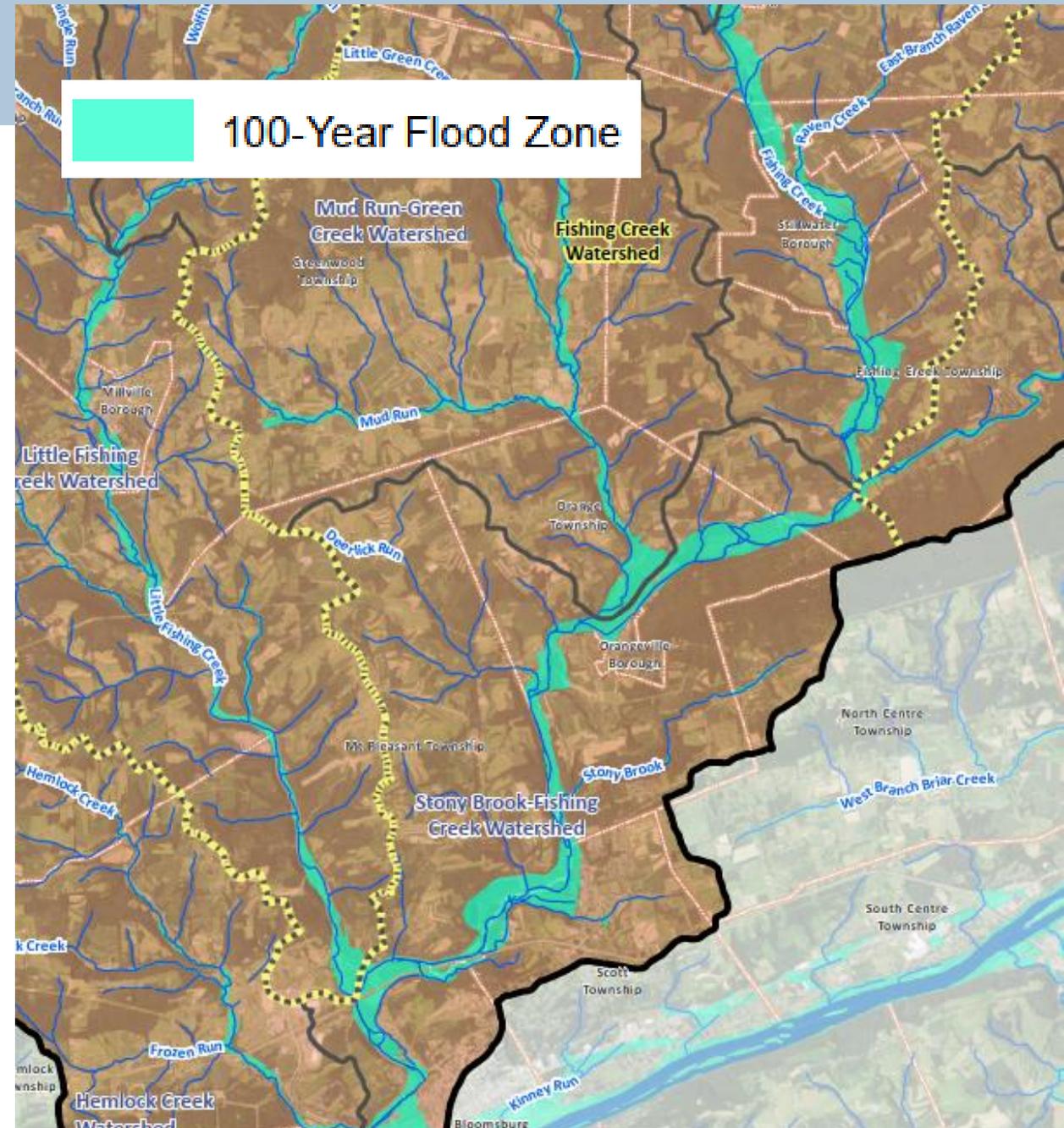
- > Fishing Creek Watershed in Columbia County
- > 18 Municipalities
- > 227 Square Mile Area
  - 1.6x area of Philadelphia
  - 3.9x area of Pittsburgh
  - 52x area of Bloomsburg
- > 293 Miles of Waterway
  - 5% (10) of covered bridges in PA
- > Land Use & Form
  - Primarily forest & agriculture
  - Fill impacts floodway/floodplain
- > Substantial Past/Potential Losses\*:
  - \$37 million paid losses\* 1978-2018
  - \$152+ million projected 40-year losses\*

\* Does not include infrastructure damages

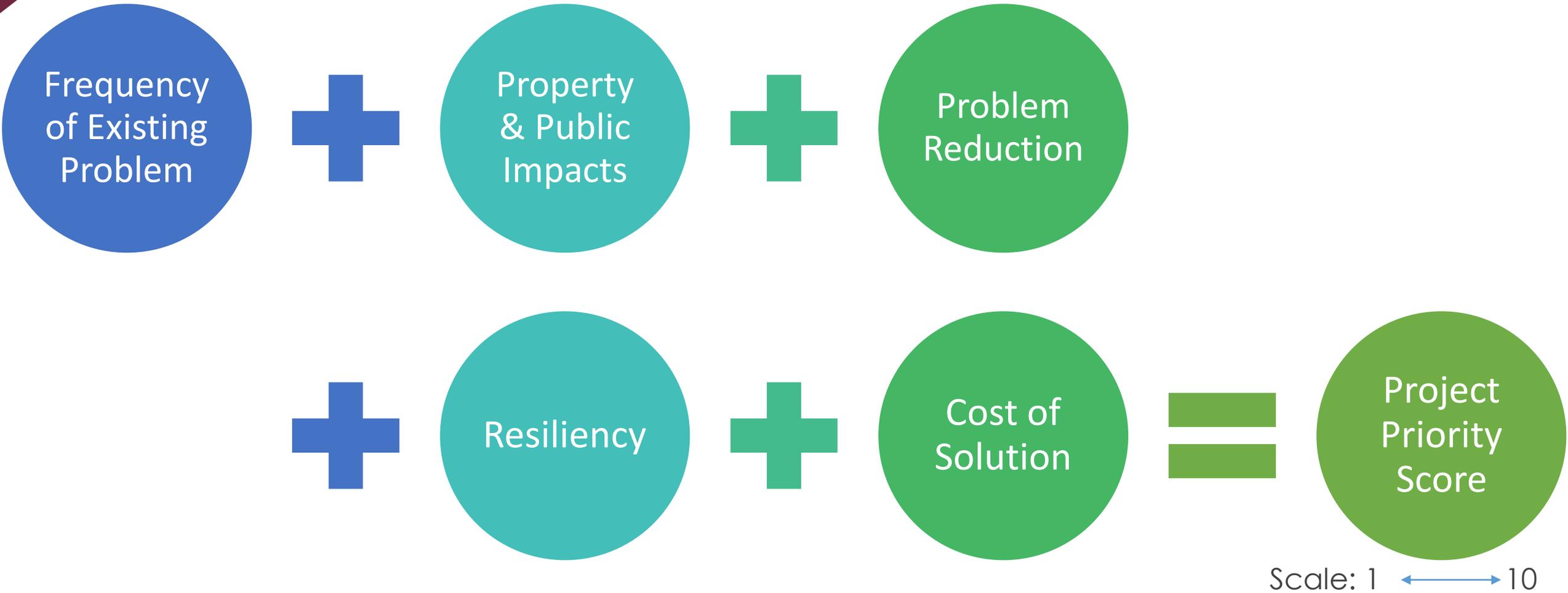


# Goals of the Study

1. Identification of Flooding **Problem Areas** within the Fishing Creek Watershed
2. Identification & Assessment of Proposed **Mitigation Measures** and Projects



# Flood Mitigation Problem Area/Project Prioritization



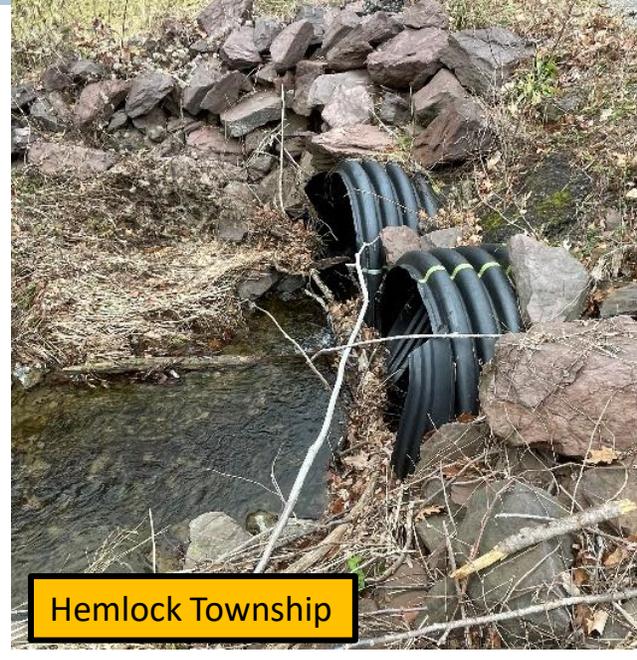
# FINDINGS AND MITIGATION OPTIONS



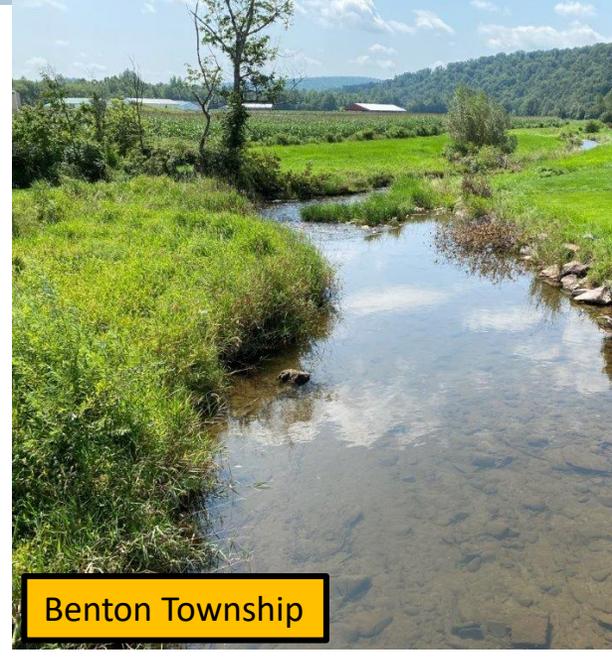
Town of Bloomsburg



Greenwood Township



Hemlock Township



Benton Township



Montour Township



Jackson Township



Sugarloaf Township



Scott Township

# Problem Area Identification

- > Sought Input for Up to 3 Problem Areas Per Municipality
- > Received Input from All 18 Municipalities
- > 75 Problem Area/Site Responses
- > 57 Problem Areas/Sites After Review/Consolidation
- > Flooding/Wet Weather Issues are Watershed Wide



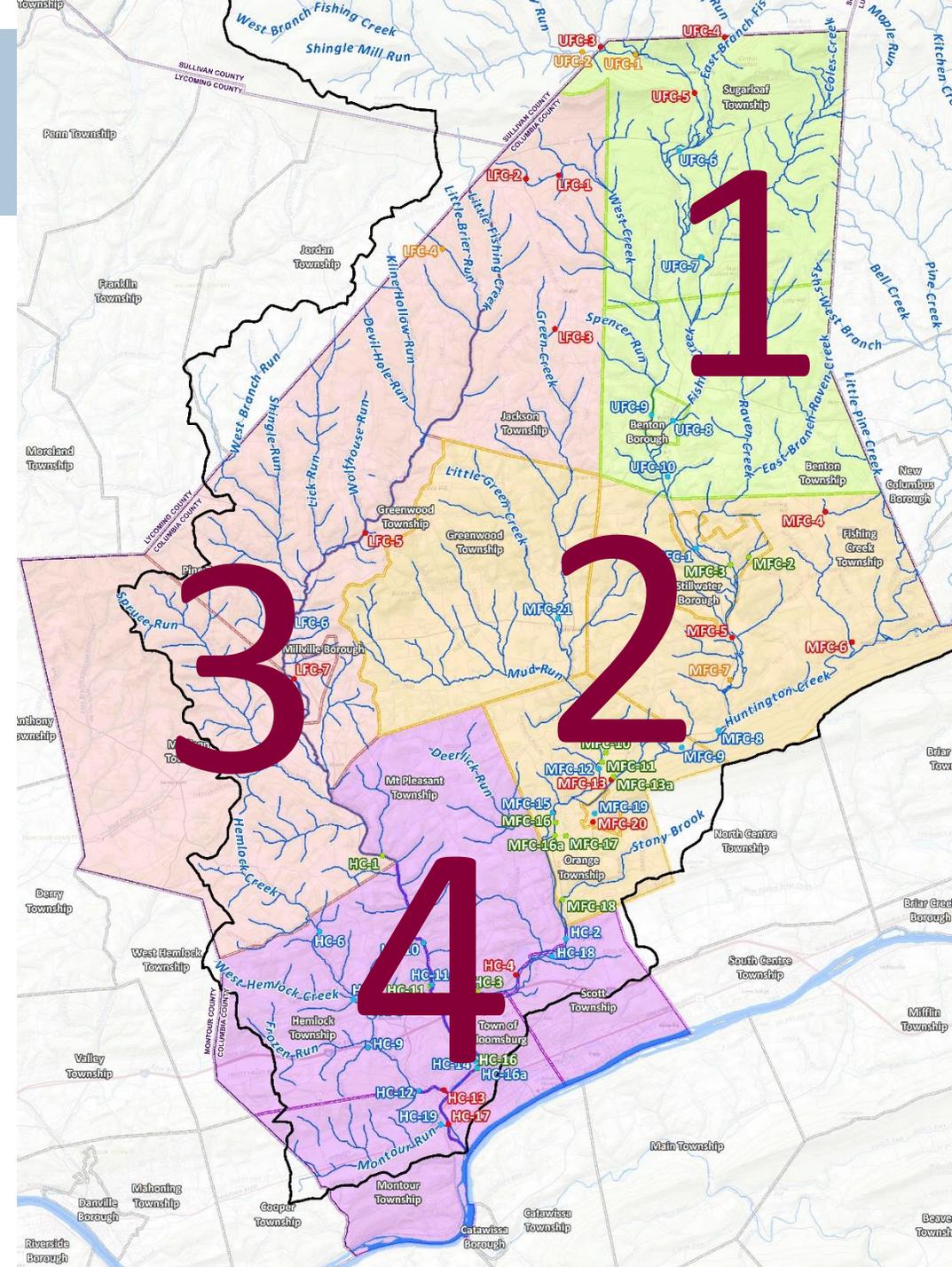
Credit: AP

Benton Borough

# Study Areas

## Four Study Areas

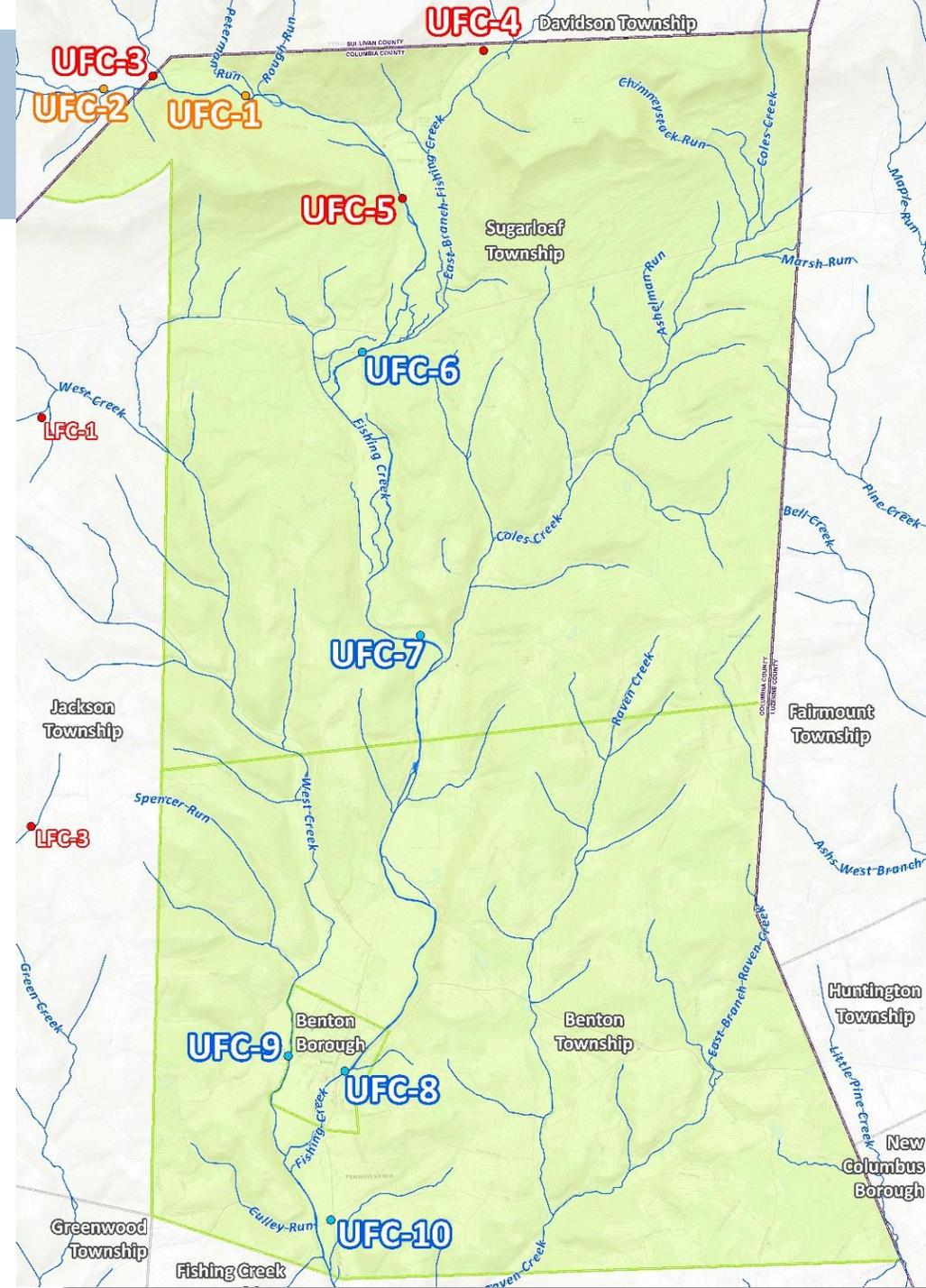
- > By Subwatershed:
  - 1: Upper Fishing Creek
  - 2: Middle Fishing Creek
  - 3: Little Fishing Creek
  - 4: Hemlock Creek-Lower Fishing Creek
- > 3-5 Municipalities per Area



# Upper Fishing Creek

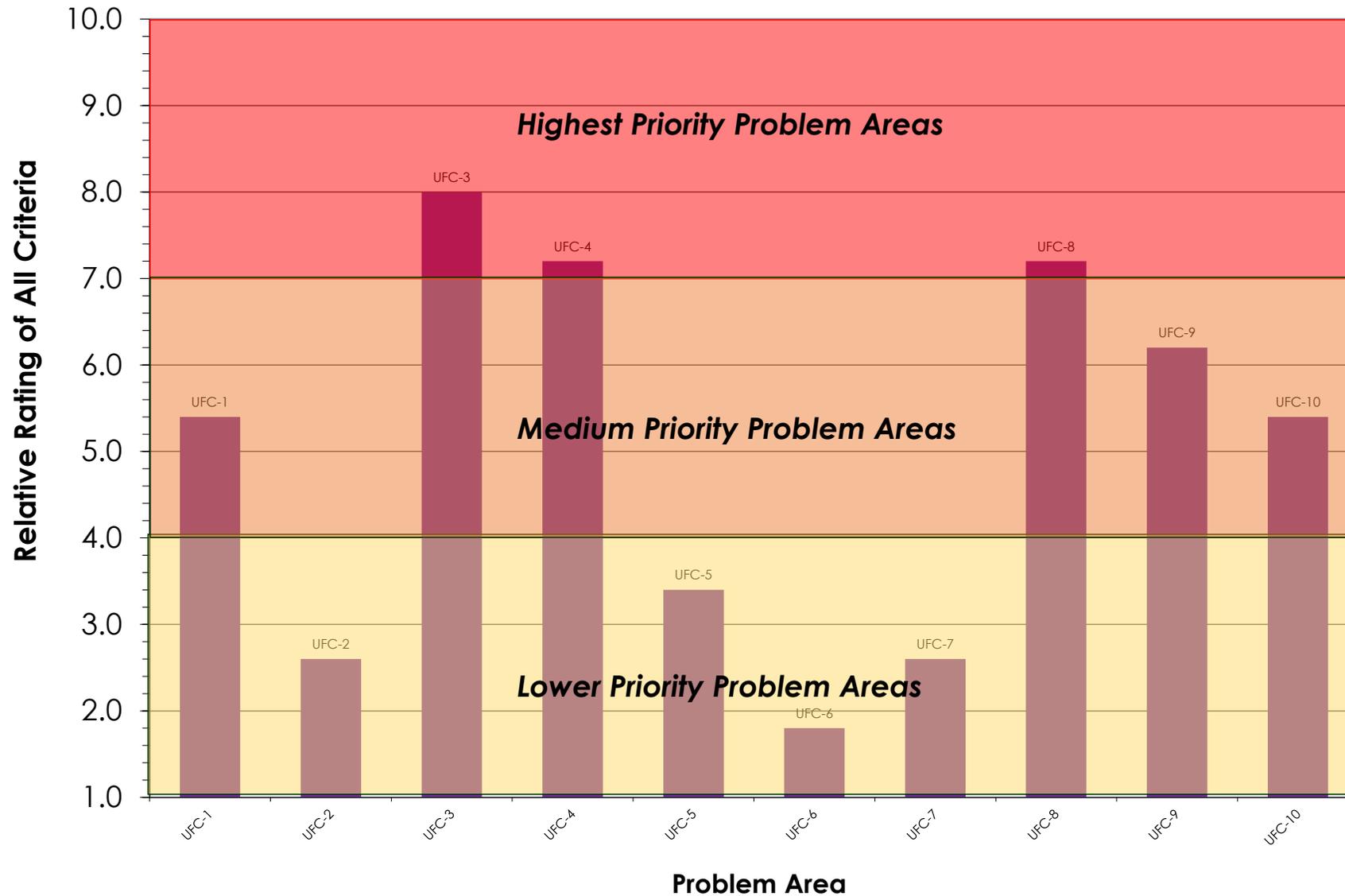
## Summary

- > 10 Problem Areas
- > Typical Issues
  - debris/logjams
  - overbank flooding
  - properties along channel (floodway)
- > Estimated Construction Cost:
  - \$35 to 61 million to implement proposed mitigation measures
  - \$24 to 44 million to implement high priority (priority score >7) mitigation measures (3)



# Upper Fishing Creek

## Problem Area Prioritization

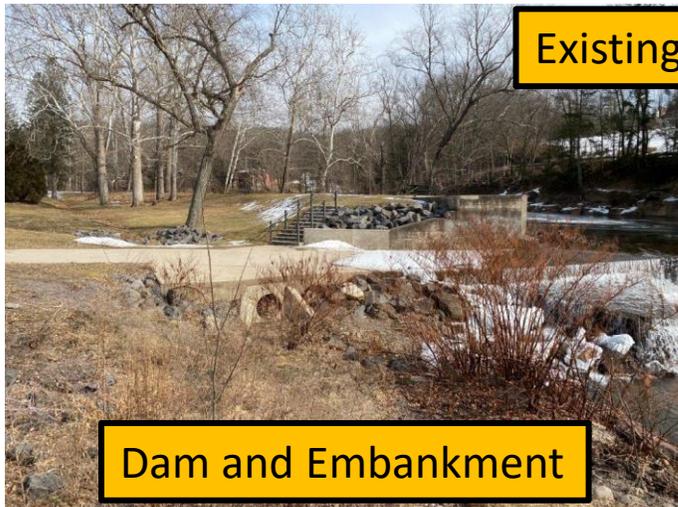
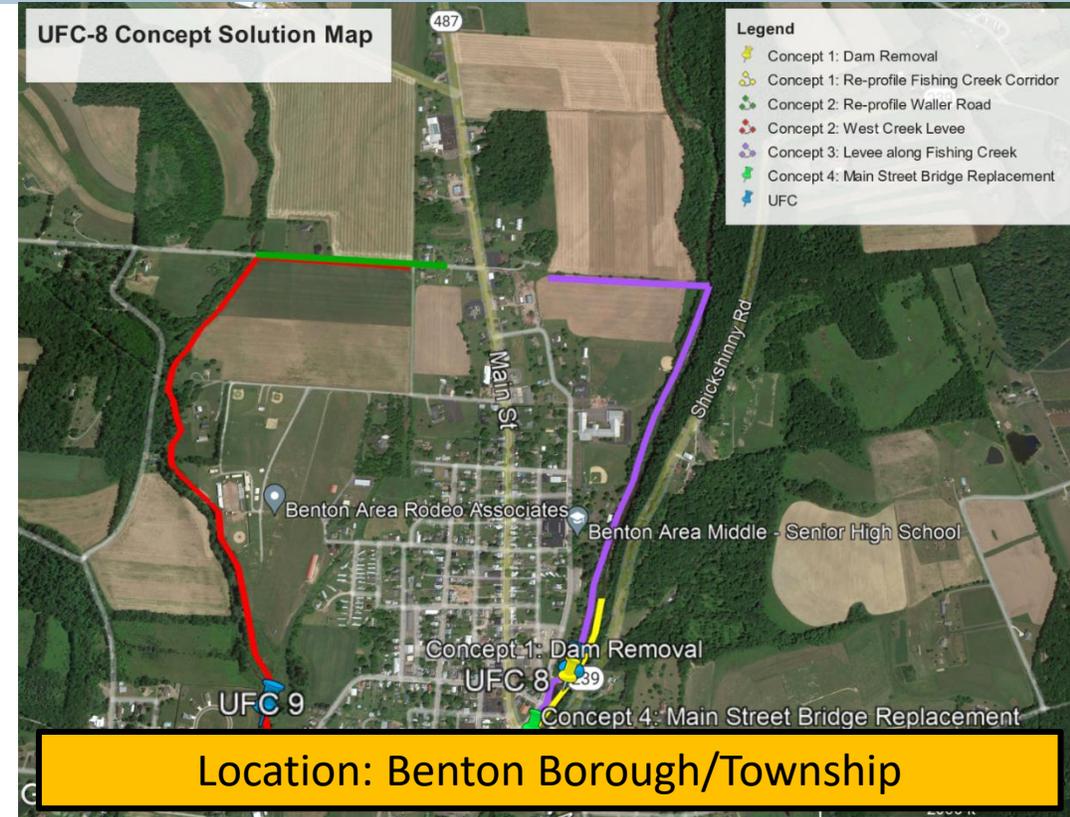


# Upper Fishing Creek

## Benton Area Flooding

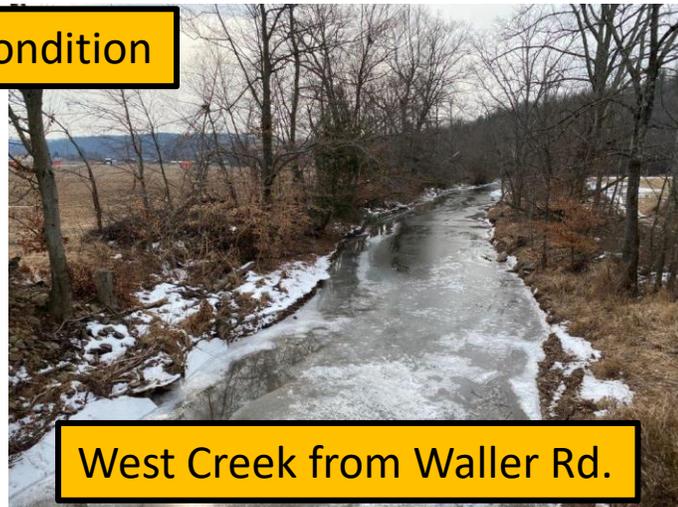
### Priority Project Summary: UFC-8

- > Issue: Constricted Channel
- > Solution: Levee/Floodwall, Dam Removal, Road Re-profiling, Voluntary Property Floodproofing
- > Estimated Construction Cost: \$2.0 to 45 million
- > Priority Score: 7.2



Existing Condition

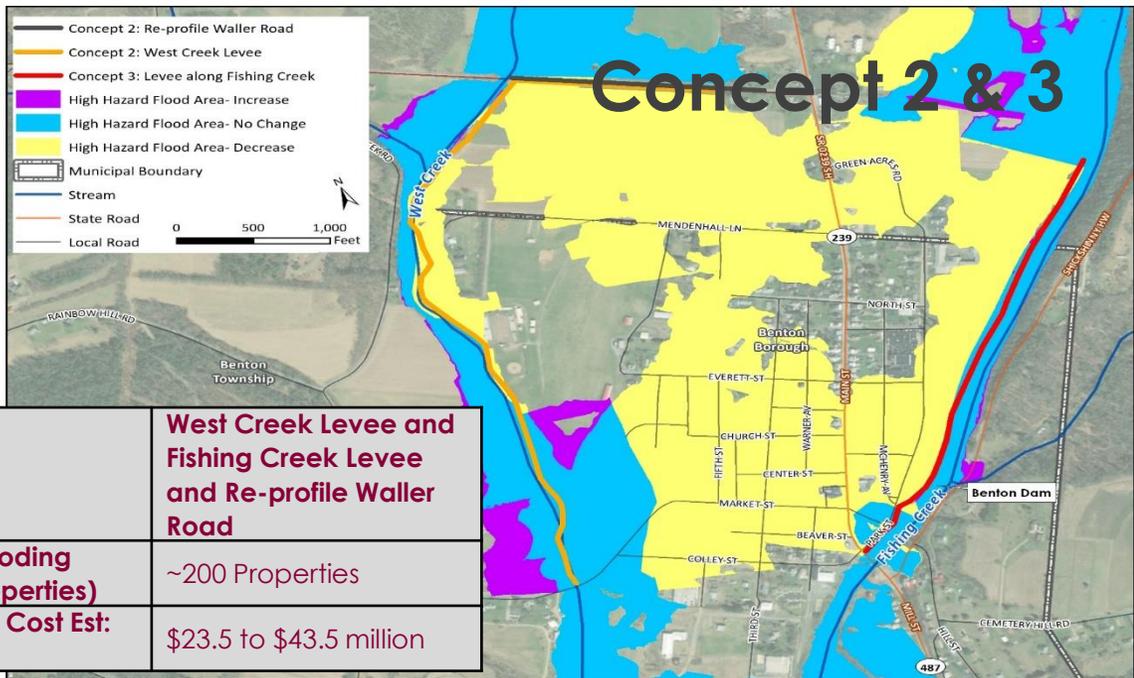
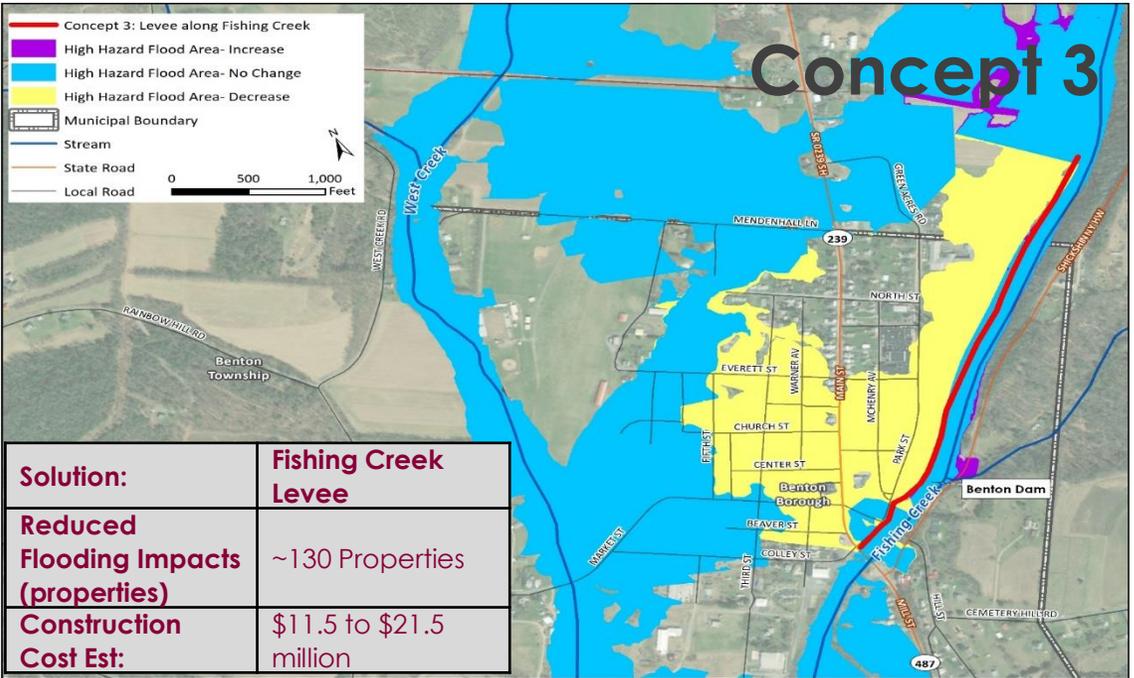
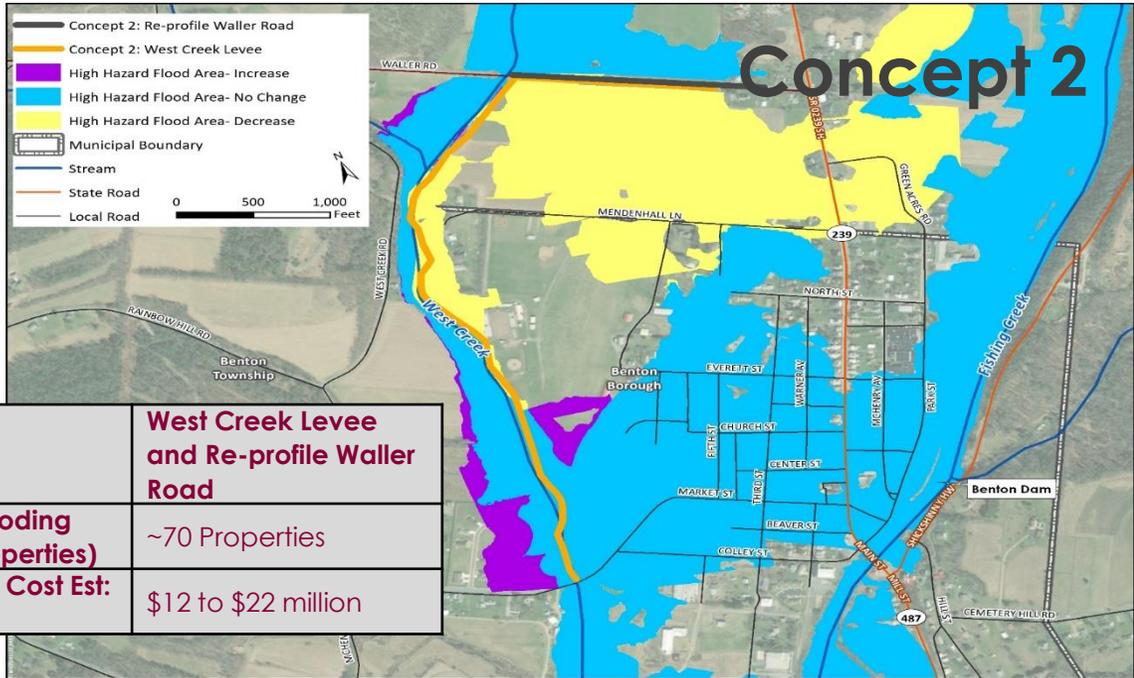
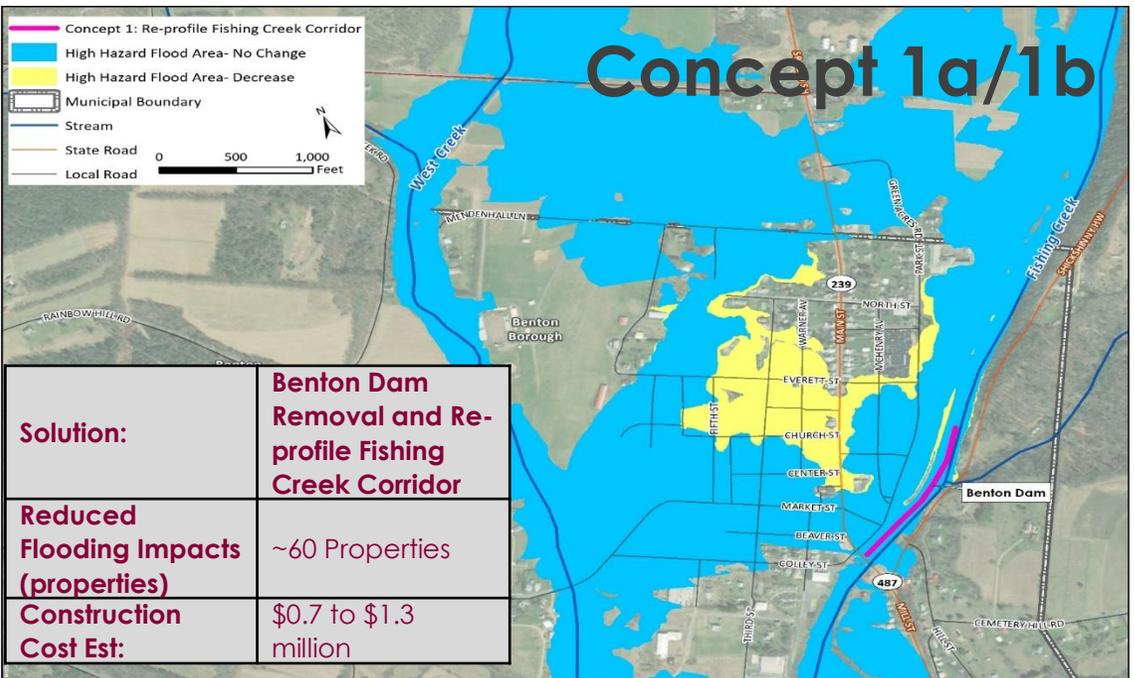
Dam and Embankment



West Creek from Waller Rd.

### Benefits:

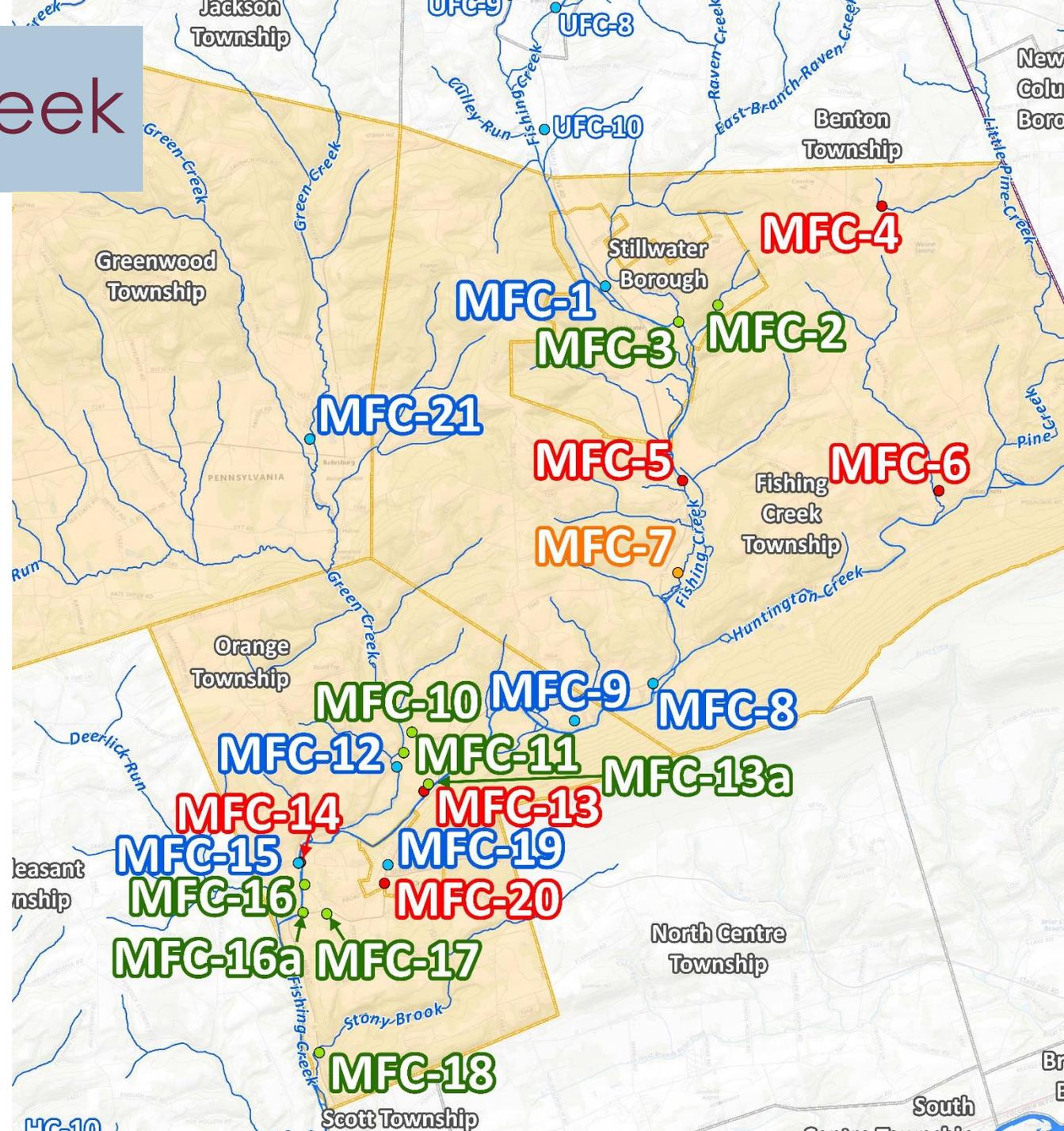
- > Reduced Local Flooding
- > Reduced Stream Velocity
- > Up to 200+ Properties and Benton Area Schools Directly Impacted
- > Up to 5,000 Vehicles Per Day



# Middle Fishing Creek

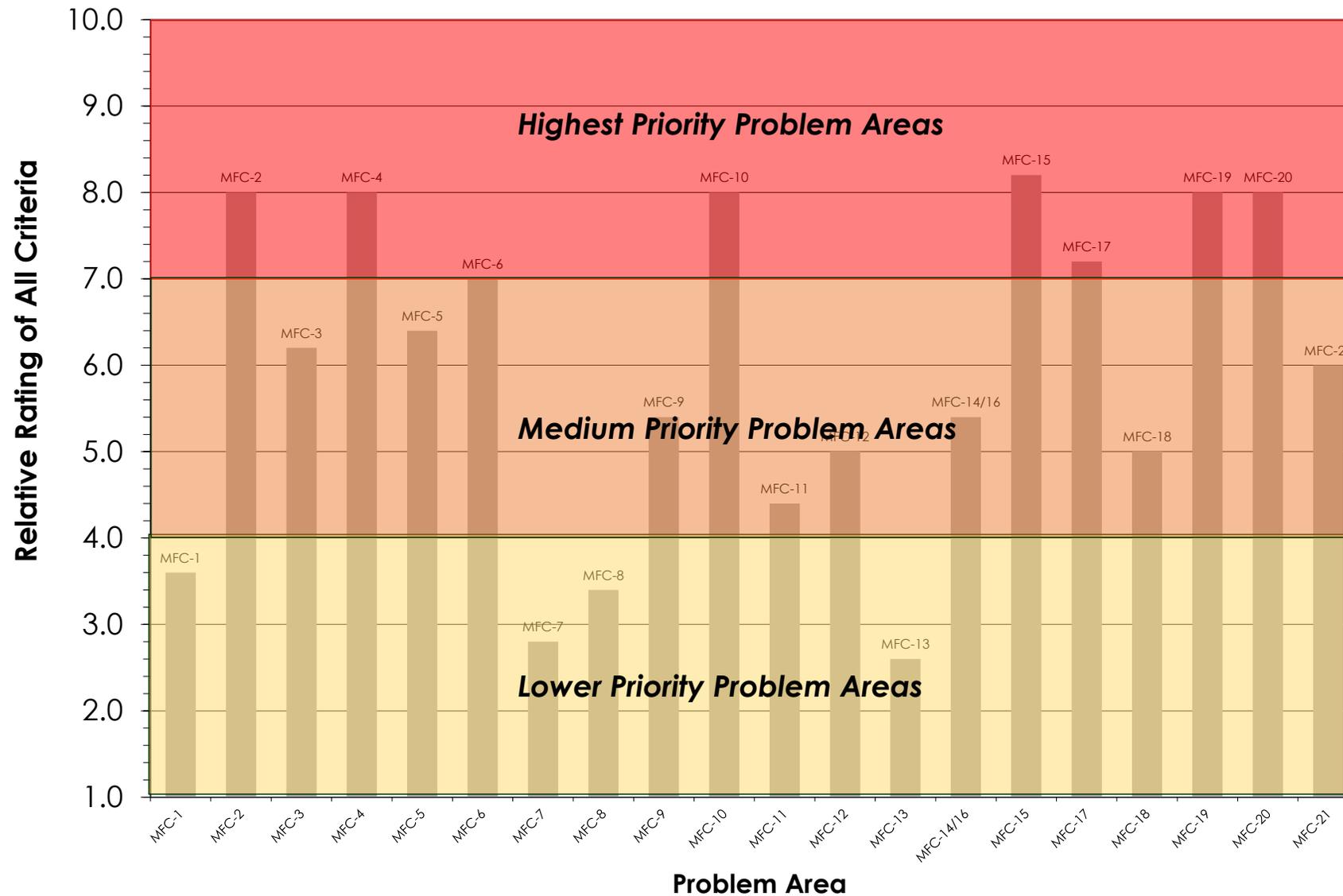
## Summary

- > 21 Problem Areas
- > Typical Issues:
  - Undersized bridges/culverts
  - Overbank flooding
  - Properties along channel (floodway)
- > Estimated Construction Cost:
  - \$40 to 71 million to implement proposed mitigation measures
  - \$3.0 to 5.6 million to implement high priority (priority score >7) proposed mitigation measures (8)



# Middle Fishing Creek

## Problem Area Prioritization



# Middle Fishing Creek Orangeville-Mt. Pleasant Flooding

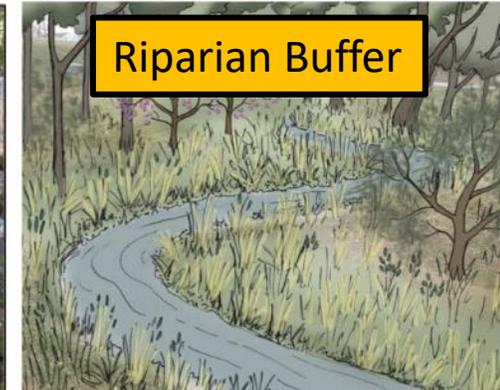
## Priority Project Summary: MFC-19

- > Issue: Constricted Upstream Channel and Culvert
- > Solution: Culvert Replacement, Riparian Buffer
- > Estimated Construction Cost \$150,000 to \$280,000
- > Priority Score: 8.0



### Benefits:

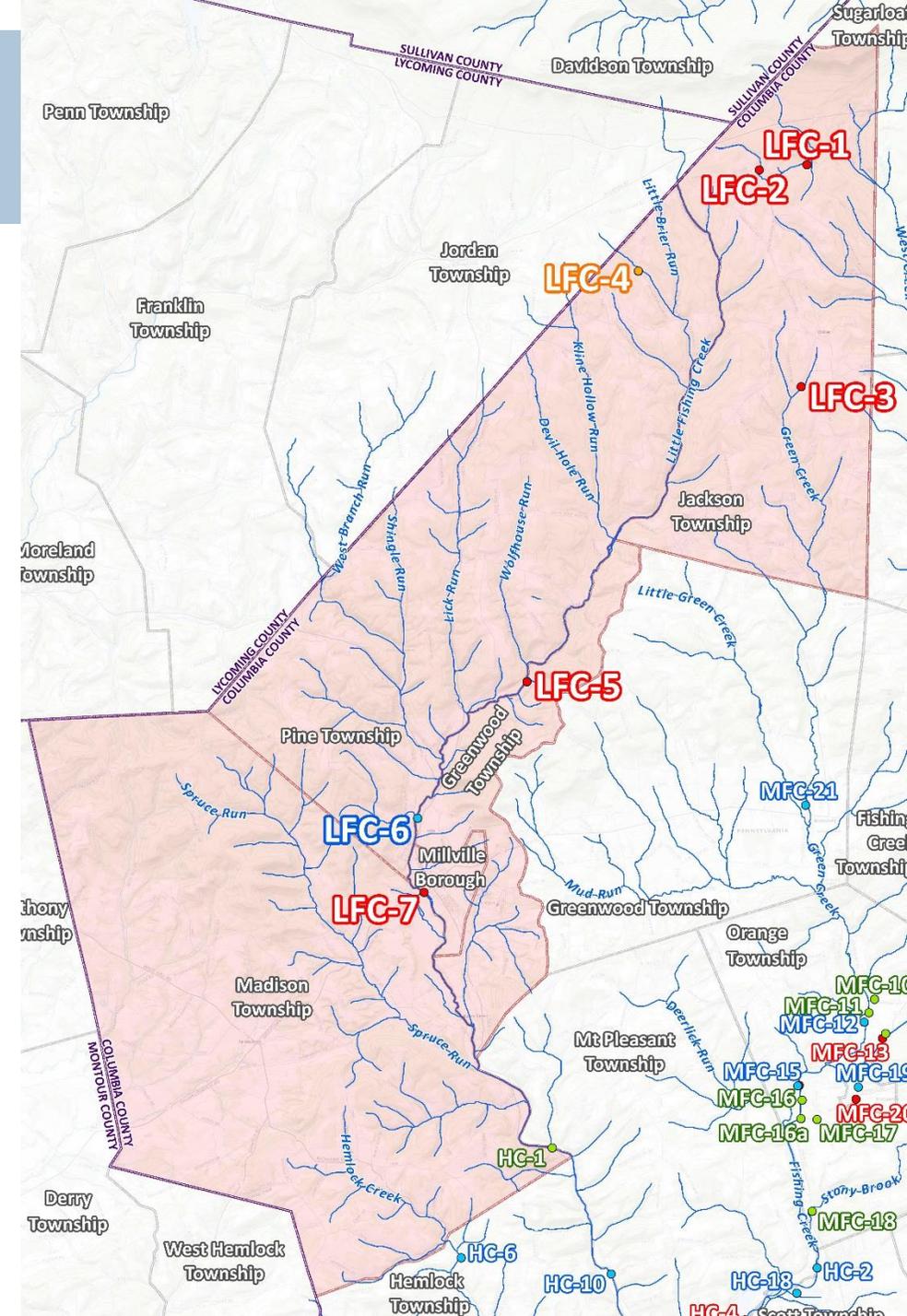
- > Reduced Roadway Flooding
- > Culvert Capacity Increased
- > Reduced Erosion
- > Approximately 4 Properties Directly Impacted



# Little Fishing Creek

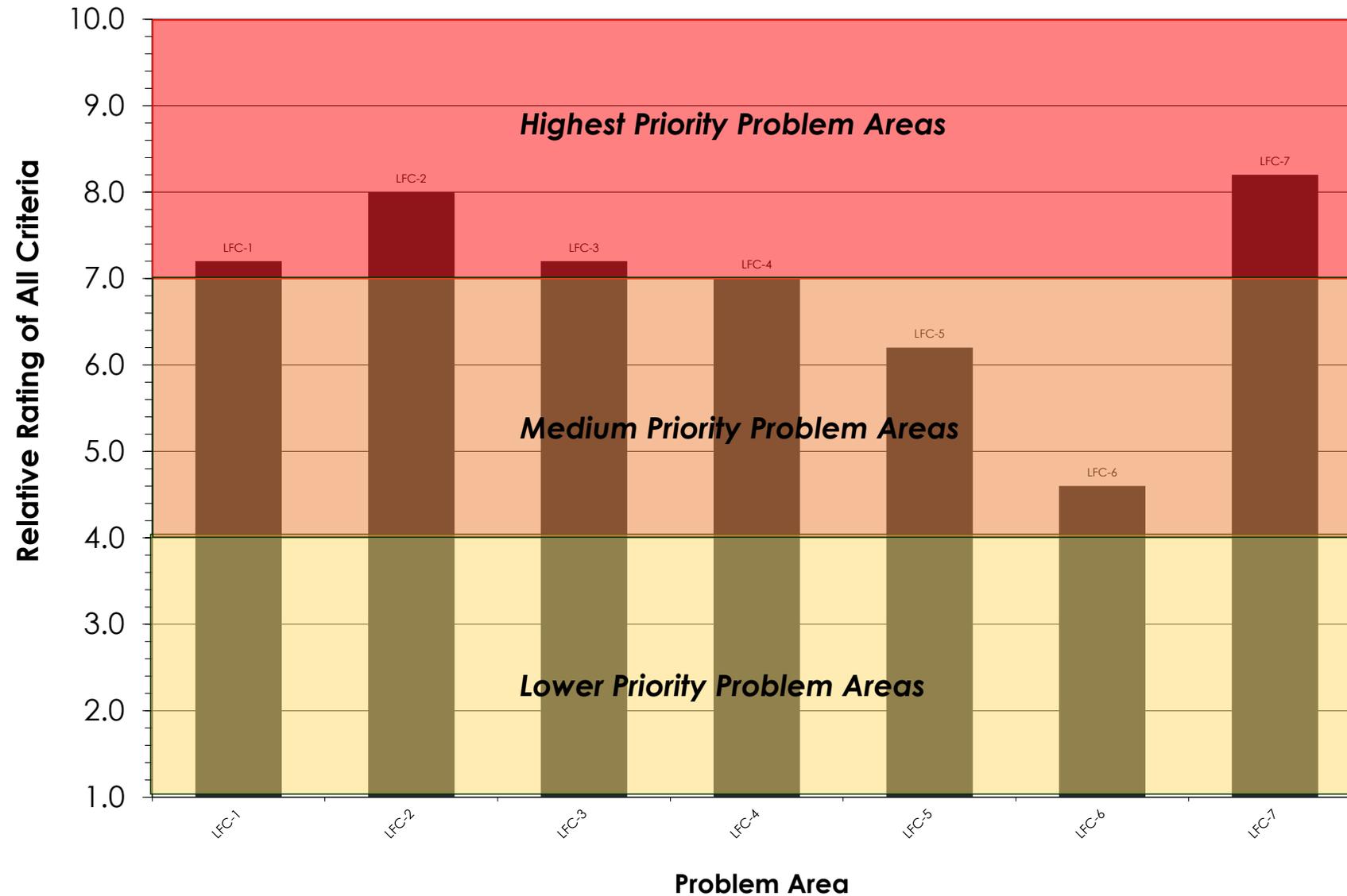
## Summary

- > 7 Problem Areas
- > Typical Issues:
  - undersized bridges/culverts
- > Estimated Construction Cost:
  - \$5.8 to 10.2 million to implement proposed mitigation measures
  - \$2.7 to 5.1 million to implement high priority (priority score >7) proposed mitigation measures (4)



# Little Fishing Creek

## Problem Area Prioritization



# Little Fishing Creek

## Main Street Bridge

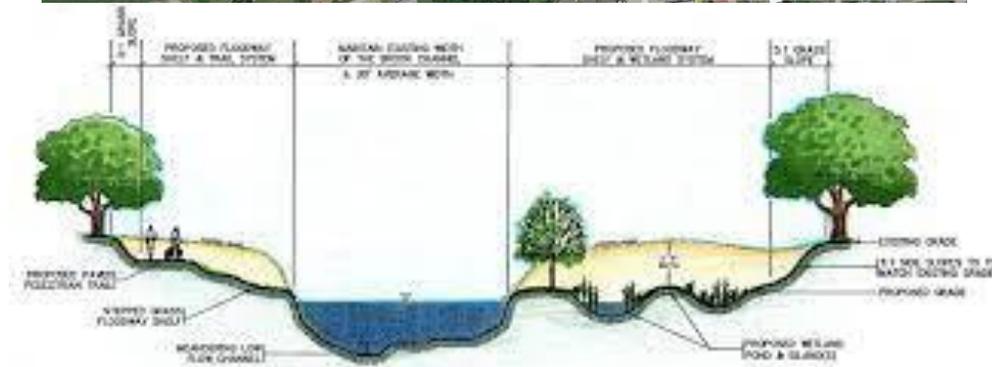
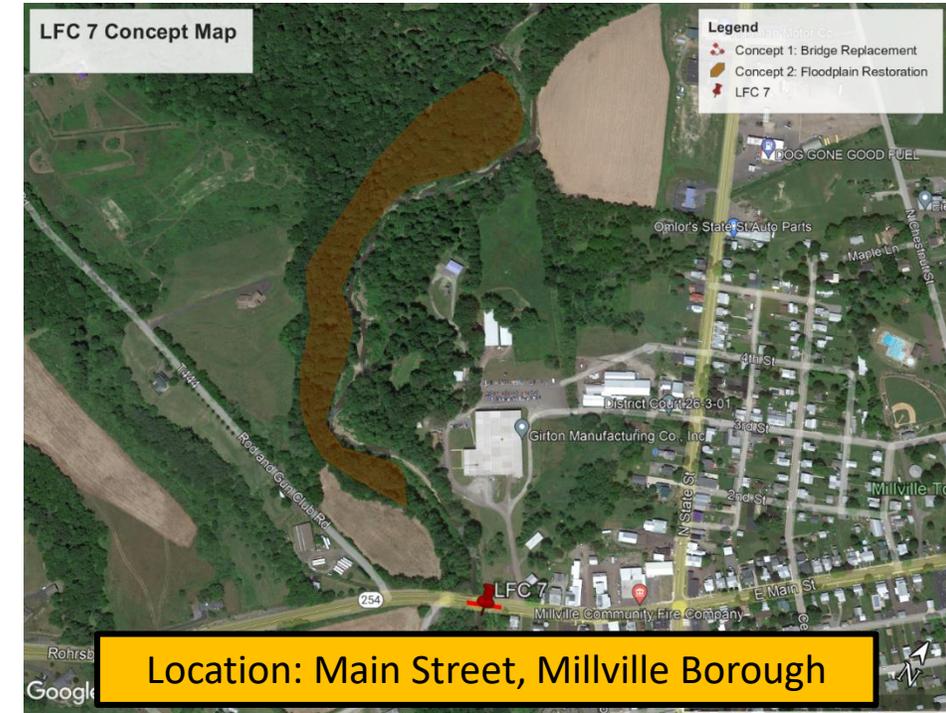
### Priority Project Summary: LFC-7

- > Issue: Undersized Bridge Opening, Constricted Channel/Floodway
- > Solution: Bridge Replacement, Floodplain Reconnection
- > Estimated Construction Cost: \$2.4 to 4.5 million
- > Priority Score: 8.2



#### Benefits:

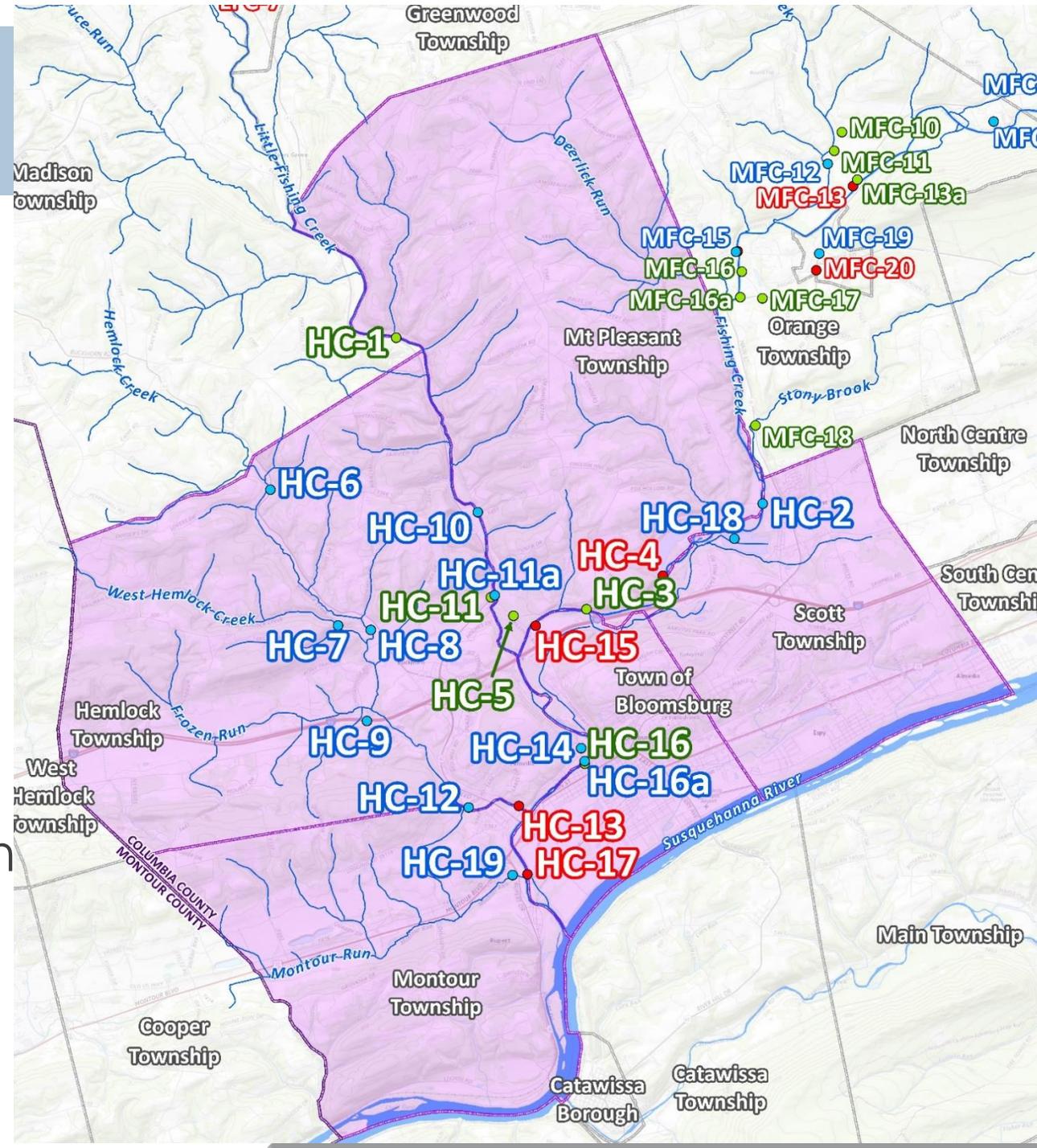
- > Reduced Roadway Flooding
- > Bridge Capacity Increased
- > Reduced Stream Velocity
- > Bridge Average Daily Traffic 2,900 Vehicles



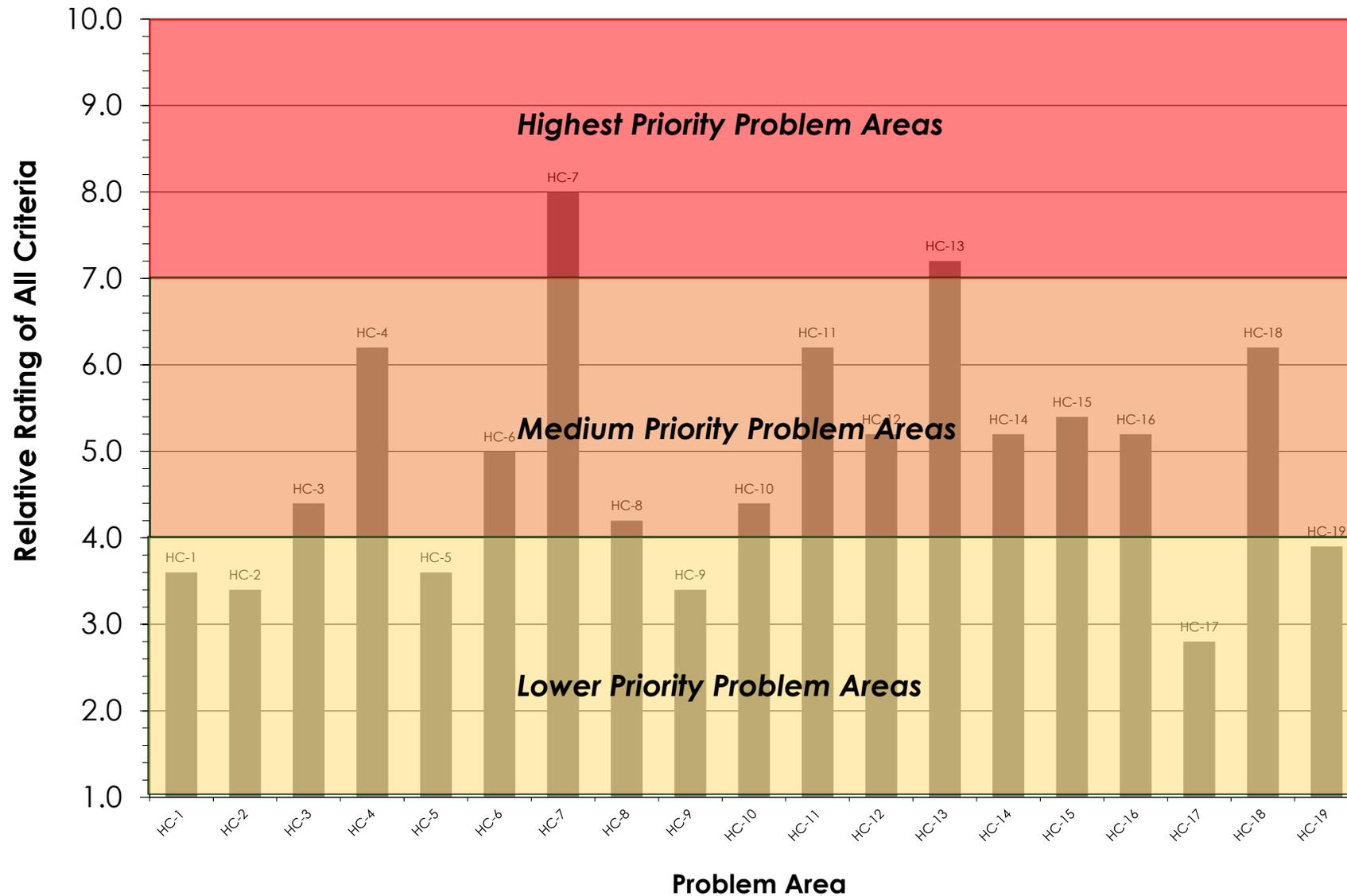
# Hemlock Creek- Lower Fishing Creek

## Summary

- > 19 Problem Areas
- > Typical Issue:
  - undersized bridges/culverts
  - constricted channel/floodplain
- > Estimated Construction Cost:
  - \$31 to 57 million to implement proposed mitigation measures
  - \$1.4 to 2.5 million to implement high priority (priority score >7) mitigation measures (2, not including West End)



# Hemlock Creek-Lower Fishing Creek Problem Area Prioritization



# Hemlock Creek-Lower Fishing Creek

## Perry Avenue Bridge

### Priority Project Summary: HC-13

- > Issue: Undersized Bridge Opening, Constricted Channel/Floodway
- > Solution: Bridge Replacement, Floodplain Reconnection
- > Estimated Construction Cost \$1.3 to 2.5 Million
- > Replacement Identified by PennDOT
- > Priority Score: 7.0



### Benefits:

- > Reduced Roadway Flooding
- > Bridge Capacity Increased
- > Reduced Stream Velocity
- > Bridge Average Daily Traffic 450 Vehicles



Location: Perry Ave., Montour/Hemlock Townships



# Next Steps: Mitigation Measure Projects

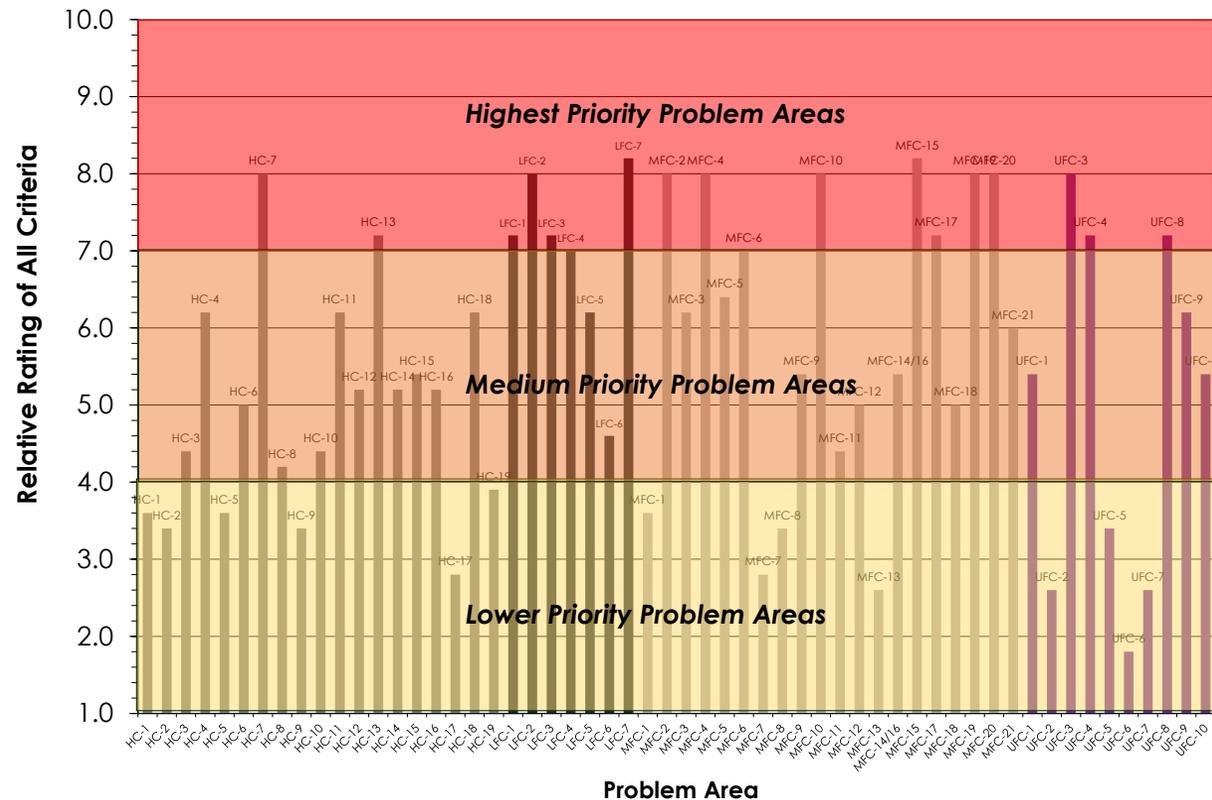
## Next Steps

- > County and Municipal Partnering
- > Identification of Funding Sources

Projects Address Issues For:

**1,000+**  
DIRECTLY  
IMPACTED  
PROPERTIES

**10,000+**  
AVERAGE DAILY  
TRIPS  
PREVENTED



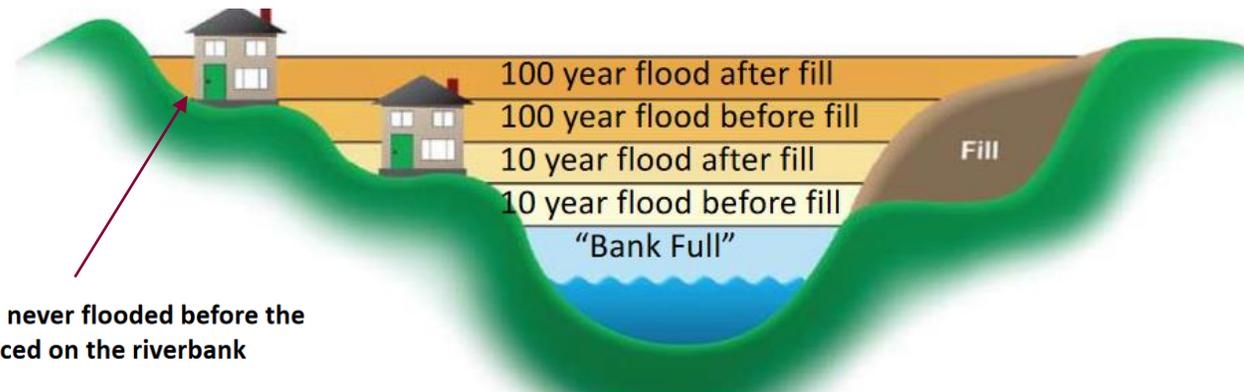
## Implementation

- > Target “Low Hanging” and Prioritized Mitigation Measures to Scope Projects
- > Active Flood Protection/Prevention at Problem Area Sites
- > Long Term Watershed Scale Impacts of Problem Area Mitigation Measures
  - Approx. 1-10% Peak Flow Reduction for 2-year Storm
  - Approx. 0-5% Peak Flow Reduction for 100-year Storm

# Next Steps: Preventative Mitigation Strategies

## Land Planning and Floodplain Management

- > Implement Countywide Action Plan → Small Scale Impacts
- > Flood Control/Floodplain Requirements → Prevent New Risks
- > Flood Warning System → Prepare Residents
- > Revisions to Timbering and E&S Controls → Prevent Debris
- > Creek Corridor Buffer Requirement → Allow Natural Functions
- > Cumulative Benefits Over Time



This house never flooded before the fill was placed on the riverbank

### The Effects of Fill on a Floodplain

#### Countywide Action Plan Overview Columbia County



#### Plan Highlights

The Columbia County Countywide Action Plan (CAP) is a roadmap to reduce pollution in county waters. Our 2025 targets are to:

- Reduce annual nitrogen pollution by 1,327,000 pounds
- Reduce phosphorus pollution by 38,000 pounds.

We will hit our targets by helping landowners install Best Management Practices (BMPs). The county is currently on track to reduce nitrogen by ~338,000 lbs and phosphorous by ~176,000 lbs, so we have more work to do. As an added benefit, the proposed BMPs will significantly lower the amount of sediment in local waters (22% of county streams have high sediment levels).

We intend for the Columbia CAP to serve as a long-term blueprint for local clean water efforts beyond the 2025 target date. It's a living document that summarizes approaches and tracks implementation efforts for local clean water activities. The plan is aspirational, but realistic. We will update the document each year, and report on our progress to local leaders and the Pennsylvania Department of Environmental Protection (PADEP). Each report will summarize progress towards long-term goals and any revisions we need to make to reach our goals.

# Break to Open House for Comments and Questions...

Final Report will be Made Available

## Study Website:

<https://seda-cog.org/departments/flood-resiliency/columbia-county-flood-mitigation-studies>

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