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Engineering & Related Services
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Fishing Creek Watershed Flooding Assessment and Mitigation Study

Public Stakeholder Engagement Meeting

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

July 29, 2021

Agenda

- Project Team
- Goals of the Study
  - What does flooding mean in Fishing Creek Watershed?
- Project Overview:
  - Data Collection/Review
  - Problem Area Identification
  - Analysis of Conditions and Potential Mitigation Strategies
  - Summary of Findings
  - Schedule
- Flooding Insight, Comments, and Questions

Project Team

Eric Stahley
Resiliency Officer

Teri Provost, CFM
Director, Flood Resiliency

Geralee Zeigler
Flood Resiliency Program Analyst

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Matt Vanaskie, PE
Project Manager – Senior Civil Water Resources Project Manager/Engineer

- Water Resources Planning/Design
- Hydrologic & Hydraulic Modeling
- Wet weather infrastructure evaluations
- Economic analysis

Erin Threet, PE
Assistant Vice President

- HRG Lewisburg Office Manager
- Water/Wastewater Engineering
- Municipal Engineering

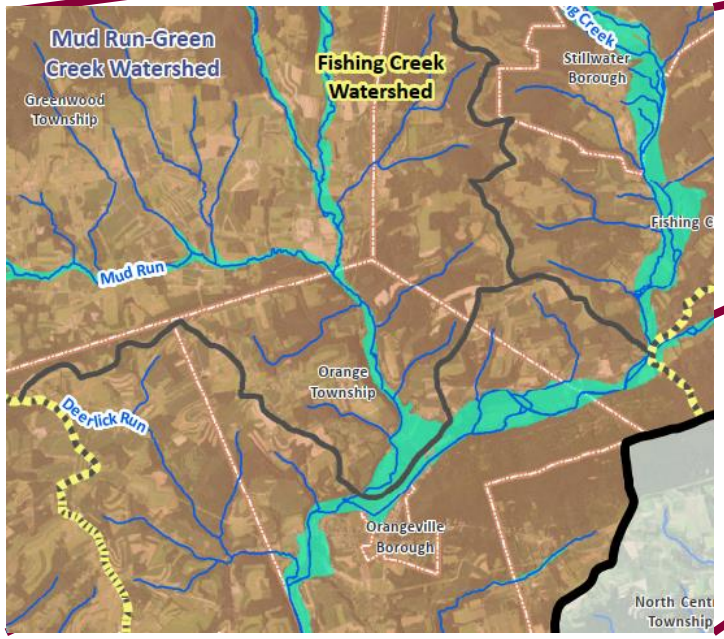
• Scott Smith, PE	Civil Engineer
• Mark Maguire, GISP	GIS Specialist
• Josh Satteson, EIT	Water-Wastewater-Agricultural Engineering
• Brian Krell, PE	Hydrologic & Hydraulic Modeling/Engineering
• Dan Angelo, PWS	Environmental/Wetland Scientist – Site Assessment

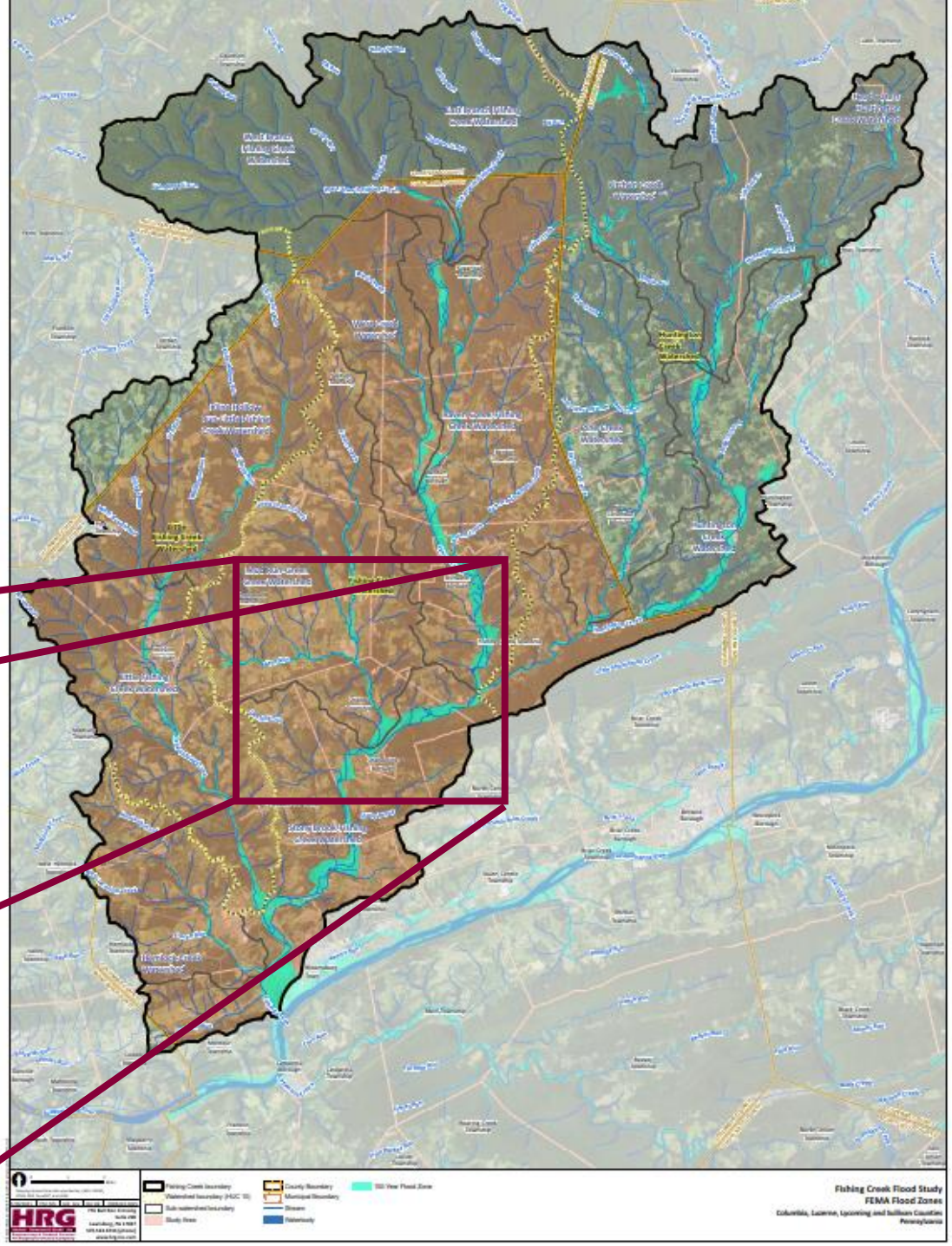
Goals of the Study

Identification of Flooding Problems

> What does flooding mean in Fishing Creek ***Watershed***?

– *Where does flooding occur?*



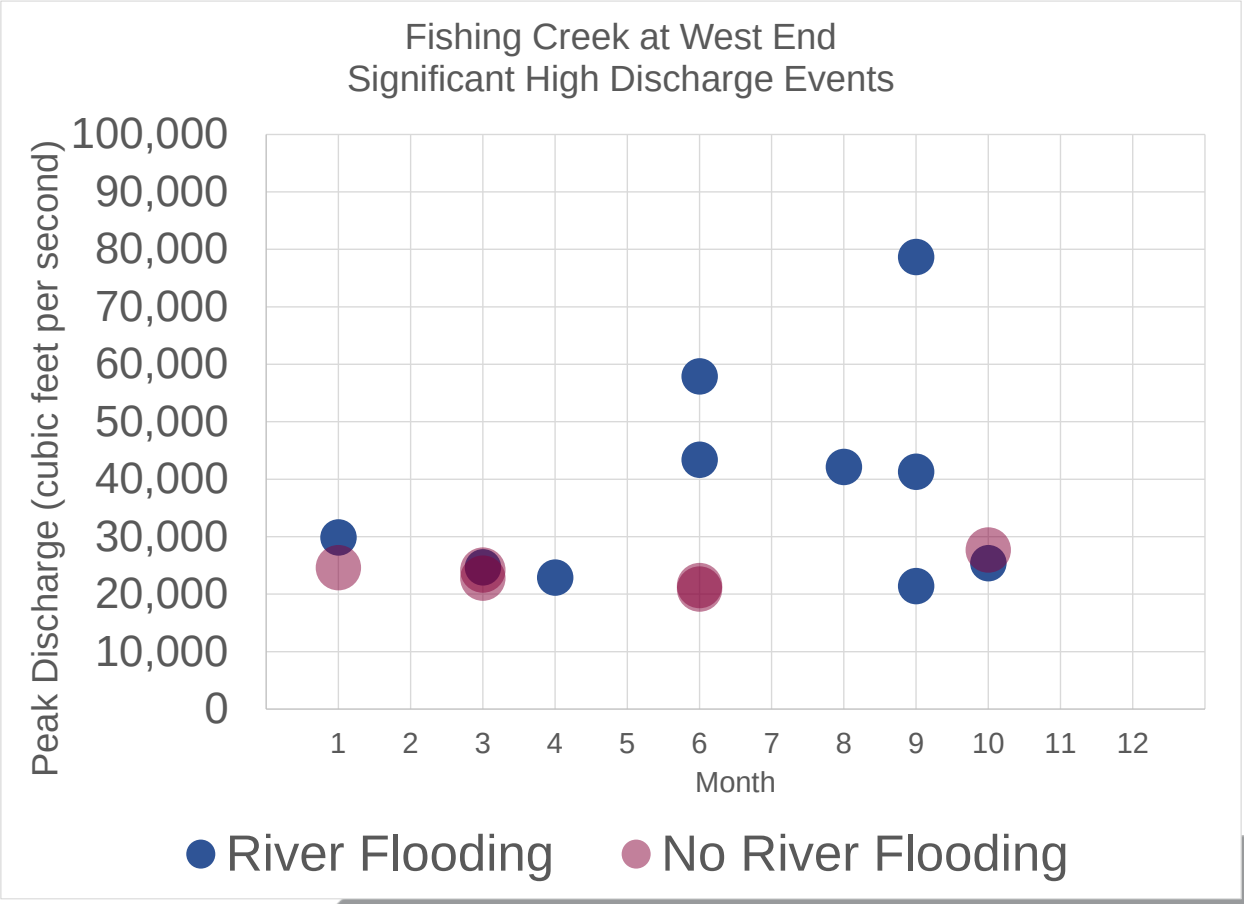


Goals of the Study

Identification of Flooding Problems

> What does flooding mean in Fishing Creek ***Watershed***?

– *When does it happen?*

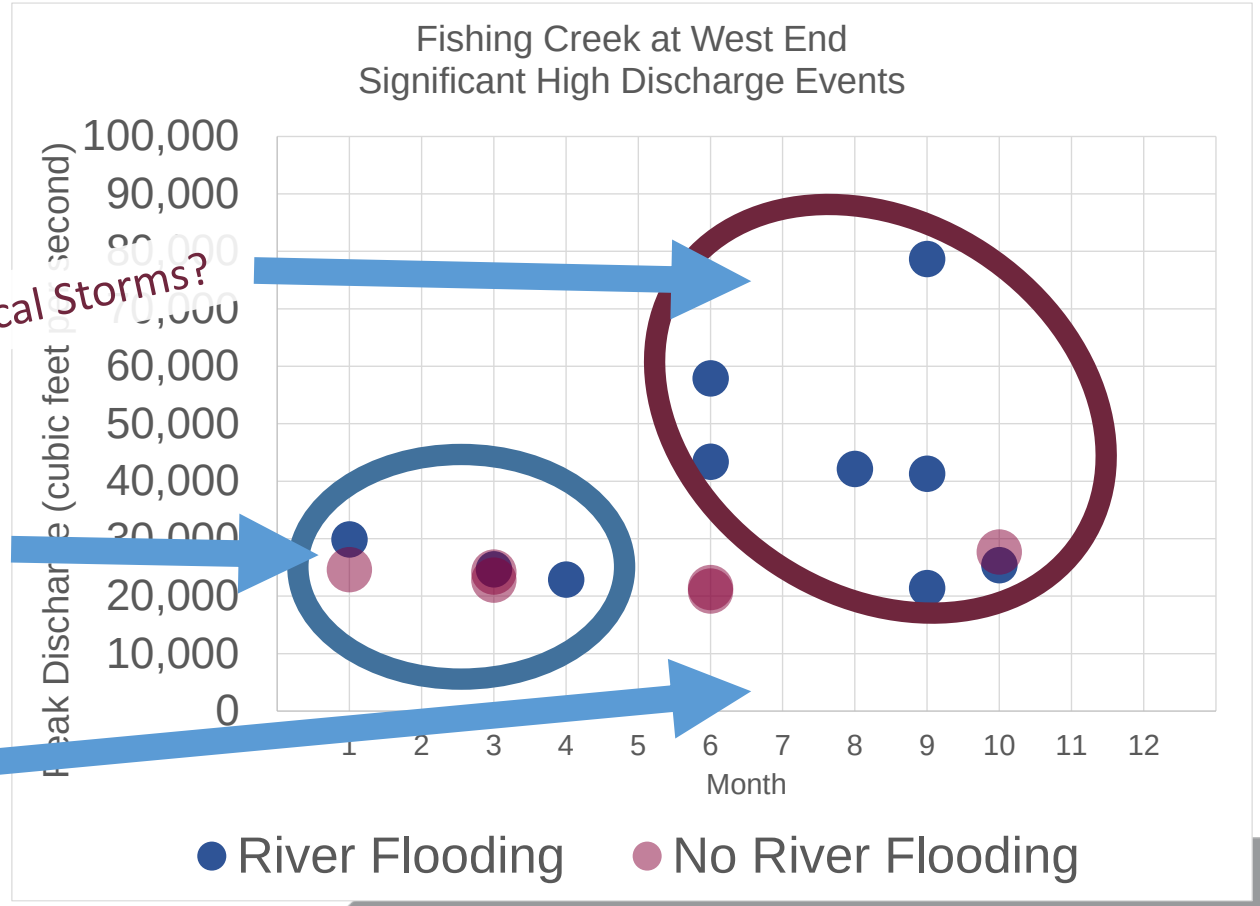


Goals of the Study

Identification of Flooding Problems

> What does flooding mean in Fishing Creek ***Watershed***?

– *Why does it happen?*

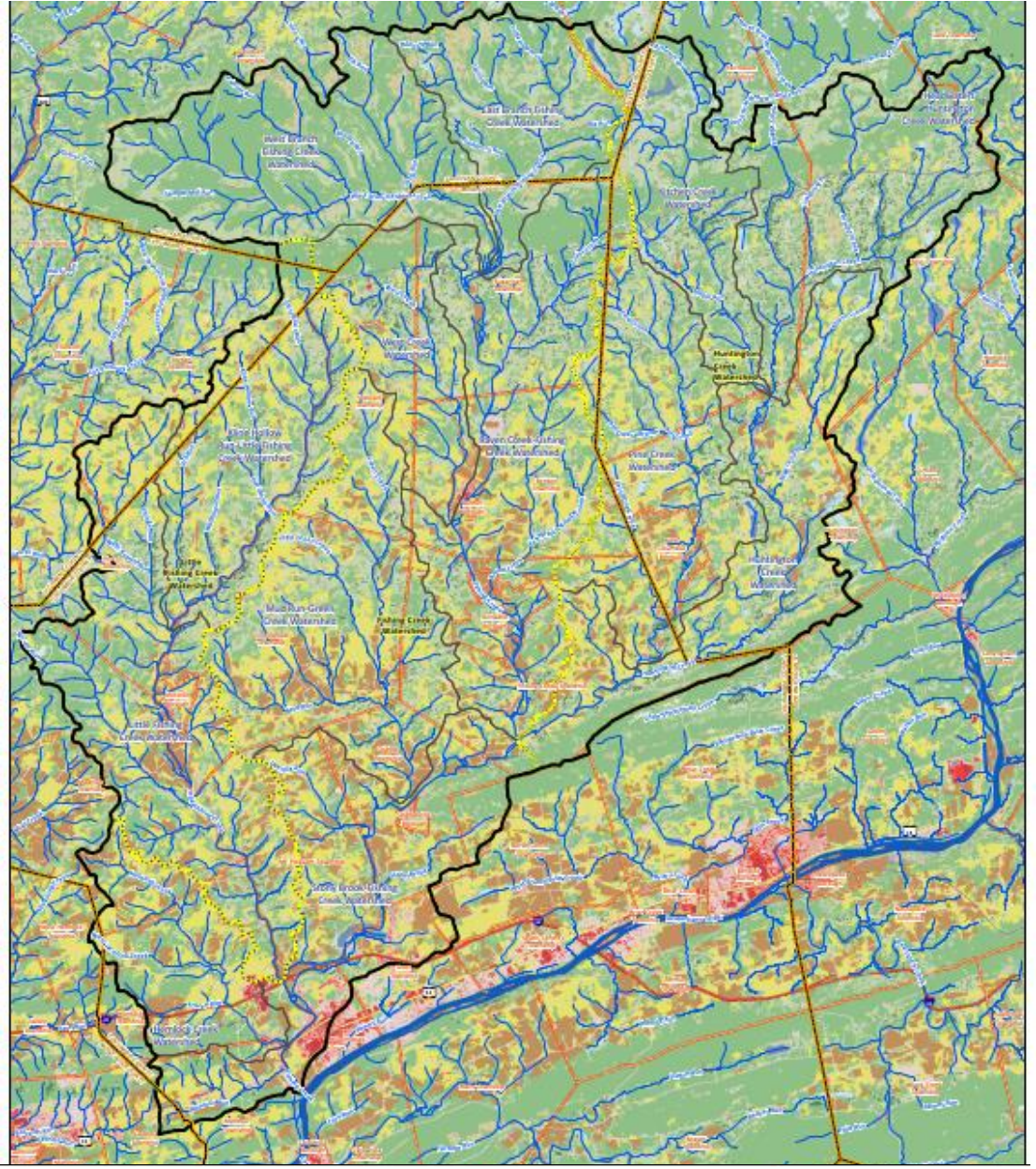


Goals of the Study

Assessment of Potential Mitigation Measures

> What is effective at mitigating or protecting against flooding?

- Strategies?
- Projects?
- Costs?



0 1 2 Miles

Mapping derived from data provided by, USGS, USFWS, FEMA, ESRI, PennDOT, and USDA.

7/21/2021	PM: MV	GIS: ALV	QA: BK	R006222.0425

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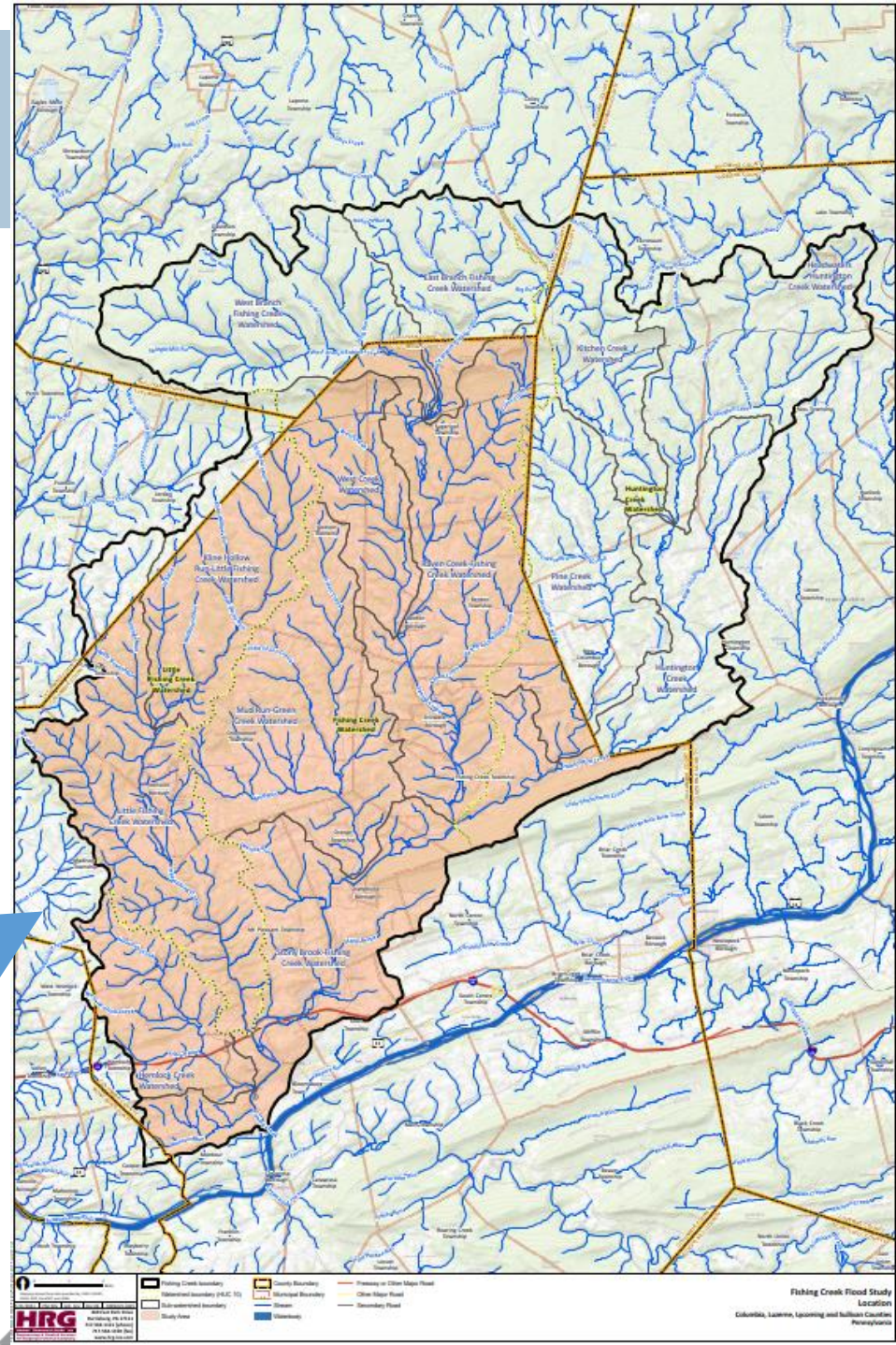
Land Cover

- Woody Wetlands
- Shrub/Scrub
- Open Water
- Mixed Forest
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Deciduous Forest
- Cultivated Crops
- Barren Land
- Fishing Creek boundary
- Watershed boundary (HUC 10)
- Sub-watershed boundary (HUC 12)
- County Boundary
- Municipal Boundary
- Stream
- Waterbody
- Freeway or Other Major Road
- Other Major Road
- Secondary Road

Project Overview

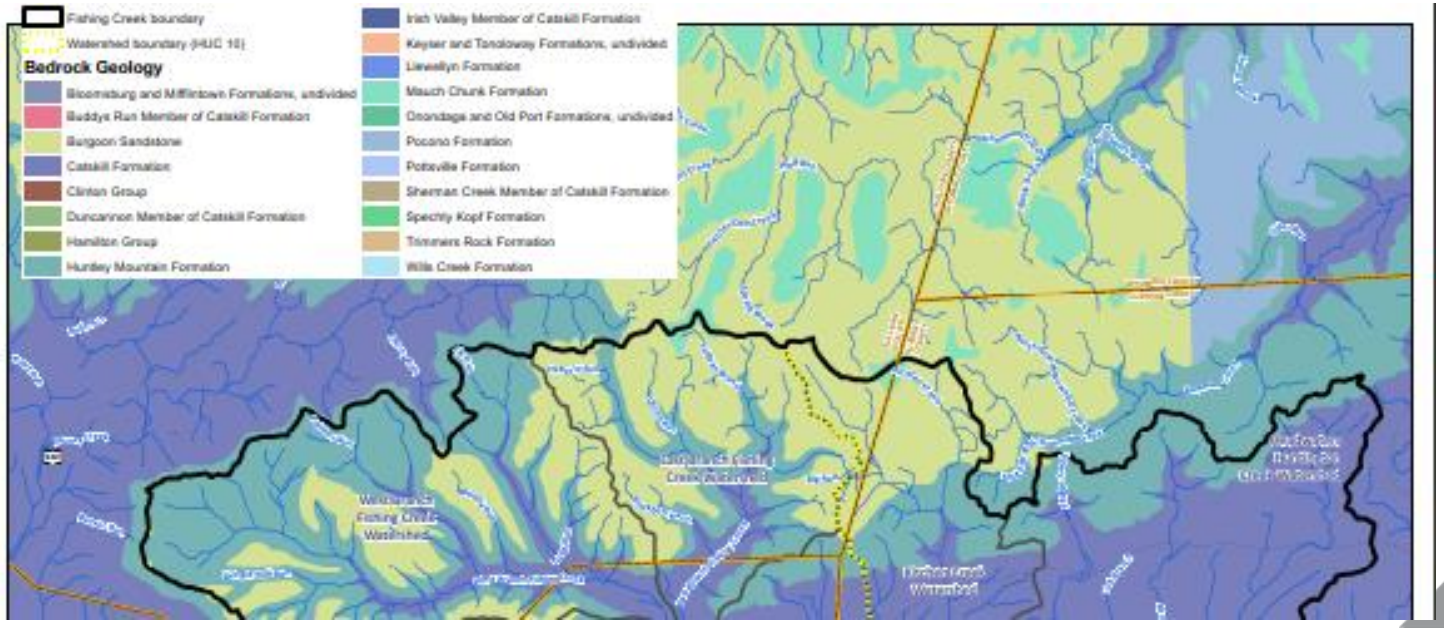
- Data Collection/Review
- Problem Area Identification
- Analysis of Conditions and Potential Mitigation Strategies
- Summary of Findings
- Schedule

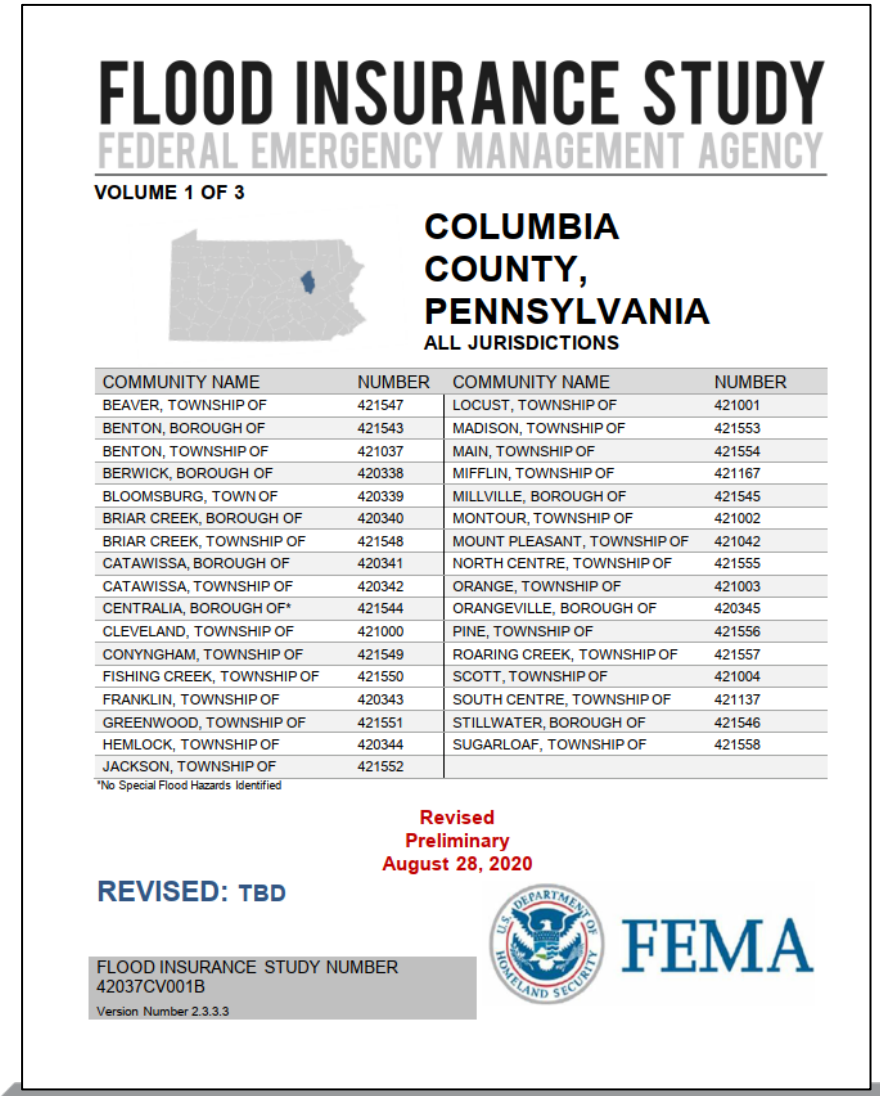
Study Area – Fishing Creek Watershed in Columbia County



Data Collection/Review

- Technical Data
  - Geology and Soils
  - Topographic and Land Forms
  - Land Use
  - FEMA flood risk model input





FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 3

COLUMBIA COUNTY, PENNSYLVANIA

ALL JURISDICTIONS

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
BEAVER, TOWNSHIP OF	421547	LOCUST, TOWNSHIP OF	421001
BENTON, BOROUGH OF	421543	MADISON, TOWNSHIP OF	421553
BENTON, TOWNSHIP OF	421037	MAIN, TOWNSHIP OF	421554
BERWICK, BOROUGH OF	420338	MIFFLIN, TOWNSHIP OF	421167
BLOOMSBURG, TOWN OF	420339	MILLVILLE, BOROUGH OF	421545
BRIAR CREEK, BOROUGH OF	420340	MONTOUR, TOWNSHIP OF	421002
BRIAR CREEK, TOWNSHIP OF	421548	MOUNT PLEASANT, TOWNSHIP OF	421042
CATAWISSA, BOROUGH OF	420341	NORTH CENTRE, TOWNSHIP OF	421555
CATAWISSA, TOWNSHIP OF	420342	ORANGE, TOWNSHIP OF	421003
CENTRALIA, BOROUGH OF*	421544	ORANGEVILLE, BOROUGH OF	420345
CLEVELAND, TOWNSHIP OF	421000	PINE, TOWNSHIP OF	421556
CONYNGHAM, TOWNSHIP OF	421549	ROARING CREEK, TOWNSHIP OF	421557
FISHING CREEK, TOWNSHIP OF	421550	SCOTT, TOWNSHIP OF	421004
FRANKLIN, TOWNSHIP OF	420343	SOUTH CENTRE, TOWNSHIP OF	421137
GREENWOOD, TOWNSHIP OF	421551	STILLWATER, BOROUGH OF	421546
HEMLOCK, TOWNSHIP OF	420344	SUGARLOAF, TOWNSHIP OF	421558
JACKSON, TOWNSHIP OF	421552		

*No Special Flood Hazards Identified

Revised Preliminary August 28, 2020

REVISED: TBD

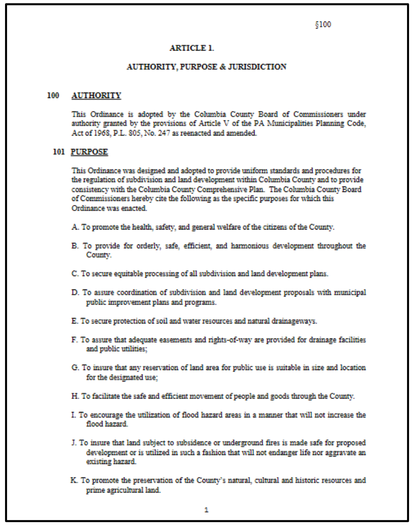
FLOOD INSURANCE STUDY NUMBER 42037CV001B

Version Number 2.3.3.3

FEMA

Data Collection/Review

- Municipal and County Land Management
  - Subdivision/Land Use Ordinances
  - Floodplain Management
- County Assessment and Planning
  - Long Term Planning Documents
  - Countywide Action Plan for Chesapeake Bay TMDL



§100

ARTICLE 1.

AUTHORITY, PURPOSE & JURISDICTION

100 **AUTHORITY**

This Ordinance is adopted by the Columbia County Board of Commissioners under authority granted by the provisions of Article V of the PA Municipalities Planning Code, Act of 1968, P.L. 805, No. 247 as reenacted and amended.

101 **PURPOSE**

This Ordinance was designed and adopted to provide uniform standards and procedures for the regulation of subdivision and land development within Columbia County and to provide consistency with the Columbia County Comprehensive Plan. The Columbia County Board of Commissioners hereby cite the following as the specific purposes for which this Ordinance was enacted.

A. To promote the health, safety, and general welfare of the citizens of the County.

B. To provide for orderly, safe, efficient, and harmonious development throughout the County.

C. To secure equitable processing of all subdivision and land development plans.

D. To assure coordination of subdivision and land development proposals with municipal public improvement plans and programs.

E. To secure protection of soil and water resources and natural drainageways.

F. To assure that adequate easements and rights-of-way are provided for drainage facilities and public utilities;

G. To insure that any reservation of land area for public use is suitable in size and location for the designated use;

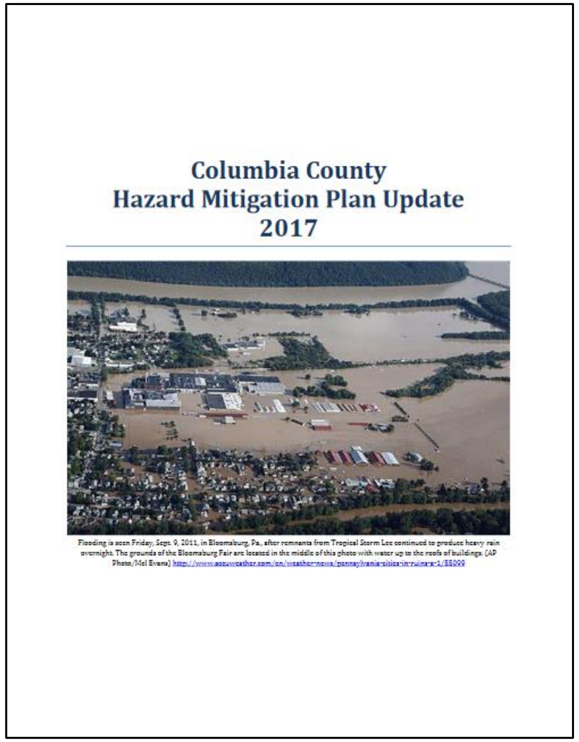
H. To facilitate the safe and efficient movement of people and goods through the County.

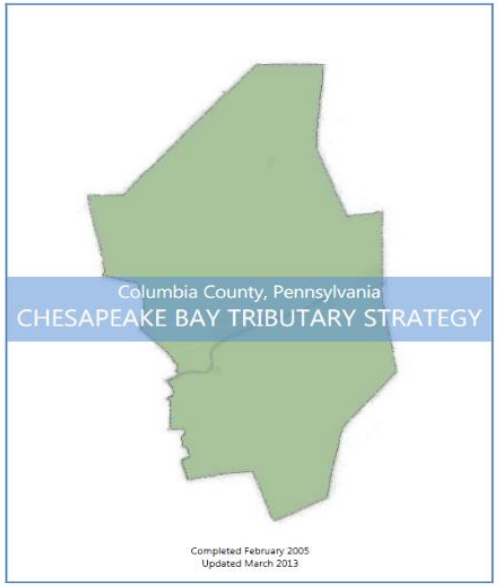
I. To encourage the utilization of flood hazard areas in a manner that will not increase the flood hazard.

J. To insure that land subject to subsidence or underground fires is made safe for proposed development or is utilized in such a fashion that will not endanger life nor aggravate an existing hazard.

K. To promote the preservation of the County's natural, cultural and historic resources and prime agricultural land.

1





Problem Area Identification – Stakeholder Identified

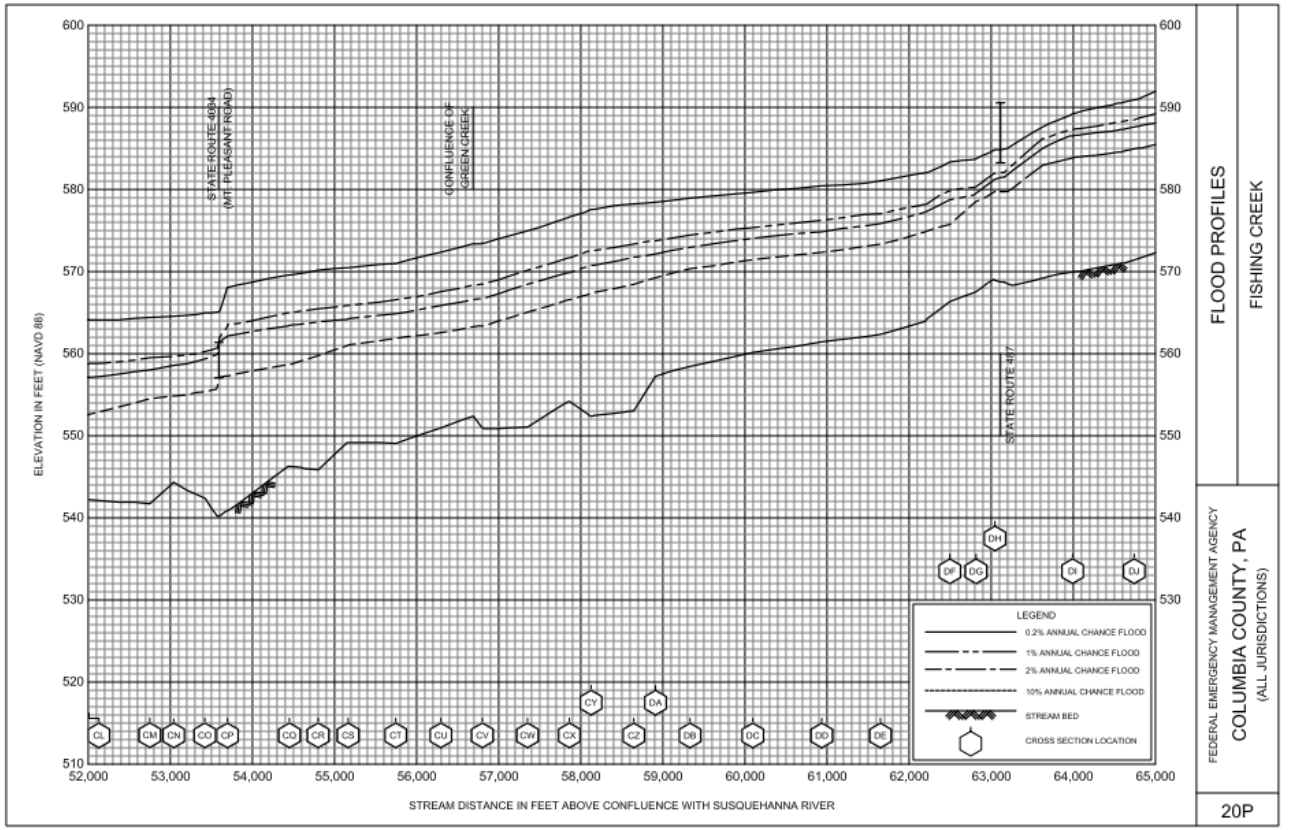
- Municipal Identified Problem Areas
  - Seeking input on up to 3 problem areas per Municipality

- County Identified Problem Areas
  - Seeking input on at least 5 additional problem areas

Problem Area Identification – via Analysis

- Hydrologic and Hydraulic Model may identify additional areas and/or confirm problem areas identified by municipalities
- Utilize, Update, Refine Existing FEMA flood risk model data

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used
Fishing Creek	Approximately 2,200 feet downstream of State Route 254 (Rohrsburg Road)	Approximately 140 feet upstream of Dam at Red Rock Road	Bulletin 15 (WRC 1967)	USACE HEC-2 step-backwater computer program
Fishing Creek	Approximately 1,200 feet downstream of Bridge at Schoolhouse Road	At the confluence with the East and West Branch of Fishing Creek	USGS rural regression equations (PSU-IV/WRI 82-21)	USGS WSPRO step-backwater computer program
Glen Brook	Confluence with East Branch Briar Creek	Approximately 225 feet upstream of T-746 (Mill Rd)	TR No. 20	USGS WSPRO step-backwater computer program
Green Creek	Confluence with Fishing Creek	Approximately 250 downstream of confluence with Mud Run	Log-Pearson Type III analysis	USACE HEC-2 step-backwater computer program
Green Creek	Approximately 840 feet downstream of State Route 254	Approximately 325 feet upstream of Winters Rd	USGS rural regression equations (PSU-IV/WRI 82-21)	Depths estimated using WRI 86-4195
Hemlock Creek	Confluence with Fishing Creek	Approximately 130 feet upstream of the confluence with Frozen Run	Log-Pearson Type III analysis	USACE HEC-2 step-backwater computer program

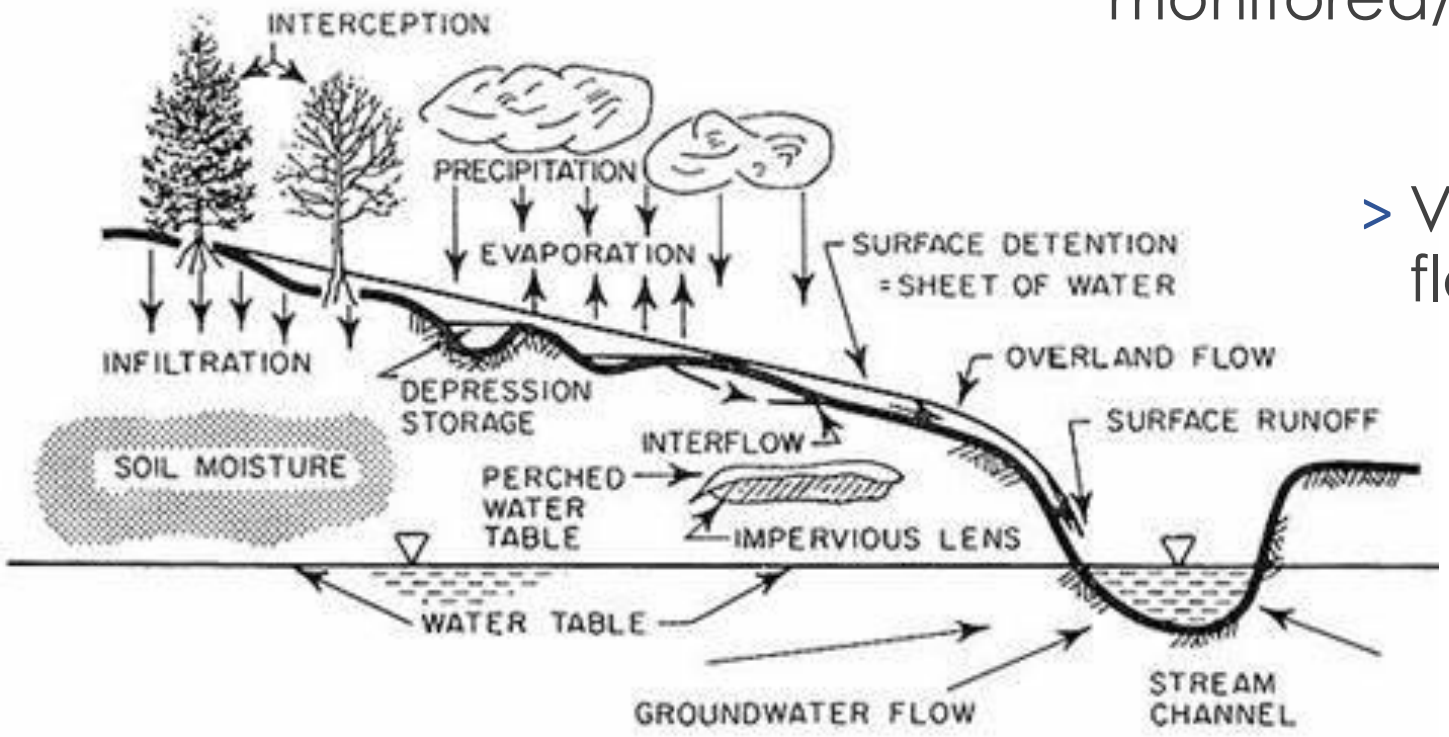


Technical Analysis – Existing Conditions

> Evaluate wet weather conditions

> Calibrate with monitored/observed conditions

> Validate against problem areas and flooding conditions

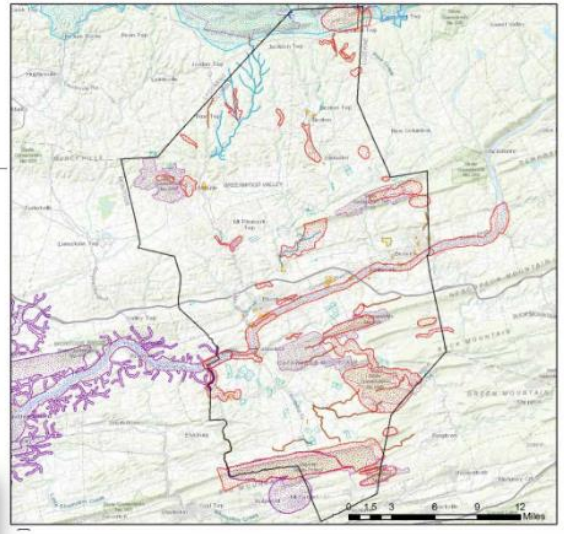


Technical Analysis – Potential Mitigation Strategies/Projects

- **Example Strategies**
- Example Solutions/Projects

Important Conservation Areas in Columbia County

Conservation Planning Category	Detected Area Summary
Natural Heritage Areas	38 sites
Protected Lands	203 tracts; 32,437.97 acres
Important Bird Areas	2 areas
Exceptional Value Streams	37.48 miles
Class A Streams	43.07 miles
Wild Trout Streams	0.12 mile



Technical Analysis – Potential Mitigation Strategies/Projects

- Example Strategies
- **Example Solutions/Projects**
  - **Local and Site Scale**

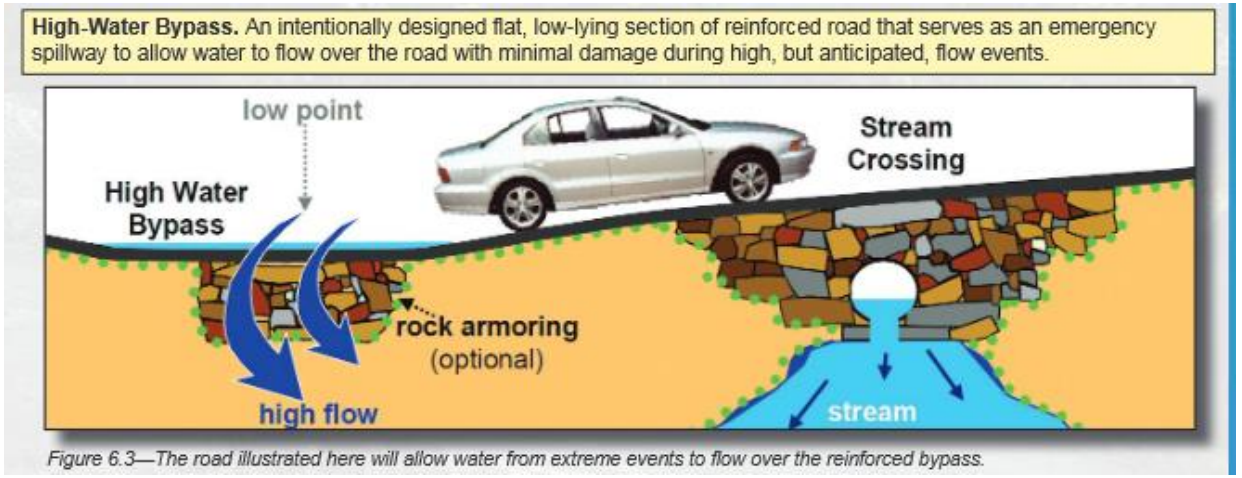
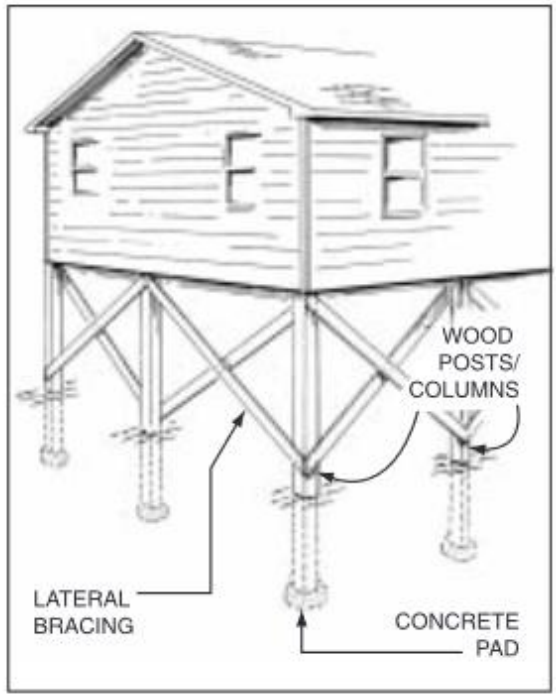


Figure 6.3—The road illustrated here will allow water from extreme events to flow over the reinforced bypass.

Technical Analysis – Potential Mitigation Strategies/Projects

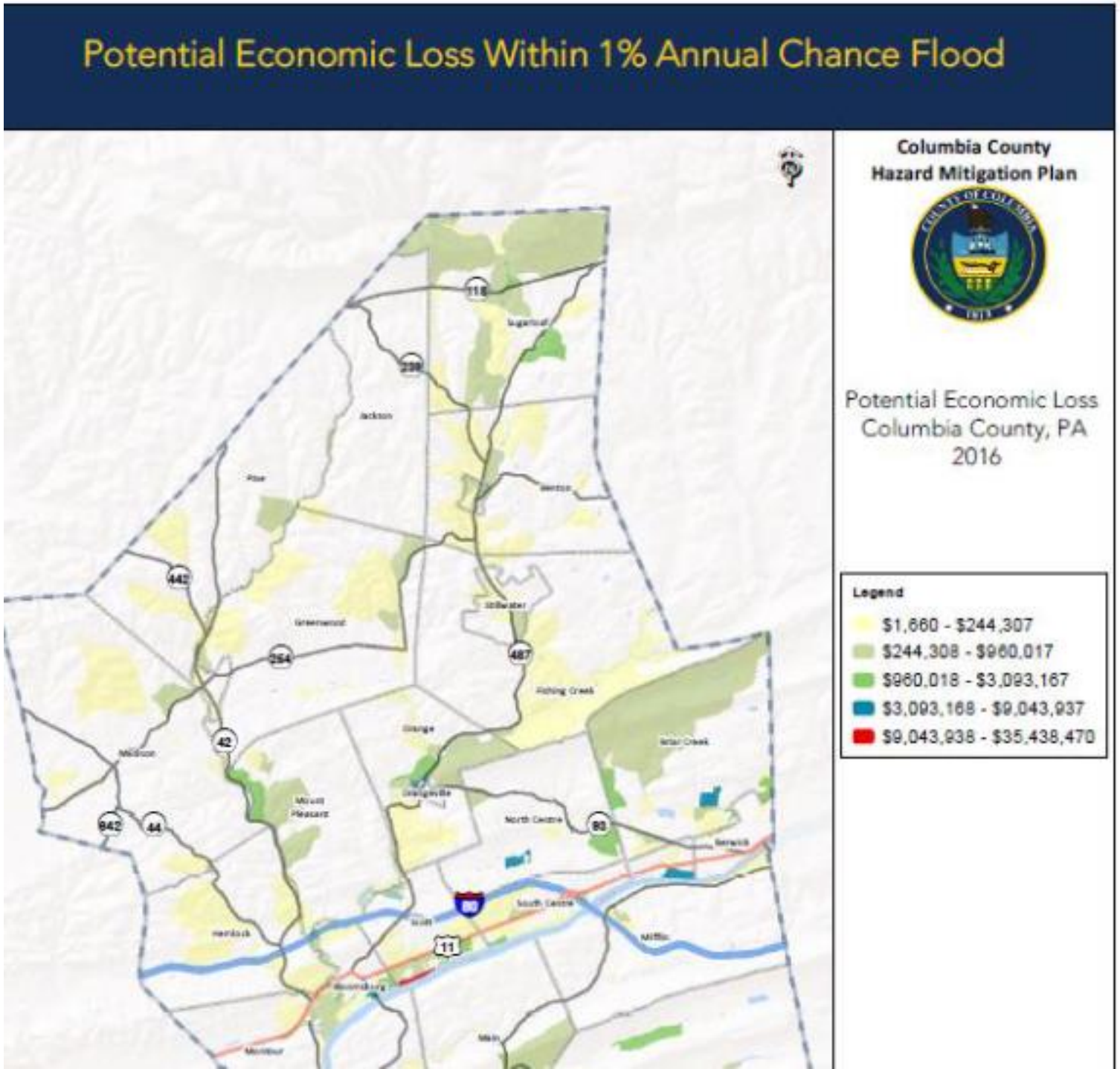
- Example Strategies
- **Example Solutions/Projects**
  - **Stream Flooding Protection**
  - **Risk reduction – floodproofing and/or elevating buildings**
  - **Risk elimination – buyout/demolition**



Floodwall construction at Bloomsburg Fairgrounds dated February 12, 2016

Technical Analysis – Risk, Feasibility, and Economic Considerations

- Risk and Uncertainty → Changing Weather and Hydrologic Conditions
- Mitigation Strategy/Solution → Feasibility
- Economic Considerations → Benefit of Strategy/Solution vs Cost of Implementation



Summary of Findings – Project Report

- Documentation of:
  - Project Process
  - Analysis
  - Findings

The preliminary outline for the Report is as follows:

Part I

Section I - Introduction
Section II - Watershed Description
Section III - Significant Problem Areas and Obstructions
Section IV - Watershed Level Flood Mitigation Planning
Section V - Technical Analysis
Section VI - Existing Municipal Regulations
Section VII - Economic Impact of Flood Mitigation Strategies
Section VII - Goals, Objectives, and Additional Recommendations
Section IX - Report Implementation
Section X - References

Maps:

- Existing Land Use Basemap.
- Subwatersheds used for hydrologic analysis.
- Hydrologic soil groups and development and floodplains.
- Stream obstructions, flooding, and problem areas.

Project Schedule

2021						2022			
July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April
Data Collection									
	Data Review and Prep								
	Site Visits								
	Technical Analysis								
		Flood Mitigation Assessment							
			Report Development						
							Public Mtg		Public Mtg
								Final Report	

Flooding Problem Area Input

Fishing Creek Flood Survey

Survey of municipal stakeholder identified flooding and wet weather issues in Fishing Creek within Columbia County.

> Link to Questionnaire

→ https://forms.office.com/r/MBgd5tN6Gk

Scan QR code →

FISHING CREEK WATERSHED FLOODING/WET WEATHER PROBLEM AREA SURVEY

Name:	Date:		
Municipality:			
Email:	Phone:		
Problem Area 1 (PA1) Location (address, intersection, landmark)*:			
Problem Area 2 (PA2) Location (address, intersection, landmark)*:			
Problem Area 3 (PA3) Location (address, intersection, landmark)*:			
Please specify what type and specific location (check multiple if applicable)	**PA 1**	**PA 2**	**PA 3**
Flooding from creek/stream/waterbody			
Flooding from runoff/stormwater conveyance infrastructure limitations			
Erosion			
Sedimentation			
Other, Please Specify*			
What do you think is the cause of this flooding/wet weather issue?	**PA 1**	**PA 2**	**PA 3**
check multiple if applicable: Runoff/Stormwater Volume			
Runoff/Stormwater Velocity			
Runoff/Stormwater Direction			
Obstruction			
Other, Please Specify*			
How frequent/regular does this flooding/wet weather issue occur (i.e. times per year)?	**PA 1**	**PA 2**	**PA 3**
Every time it rains			
More than once per year			
Less than once per year			
Only during snowmelt			
Only during tropical storms			
What types of property issues does this problem cause? (check multiple if applicable)	**PA 1**	**PA 2**	**PA 3**
Loss of life			
Loss of utilities/services			
Affects critical facilities			
Property damage			
Other, please specify*			
What types of solutions do you think would assist with this problem area? (check multiple if applicable, make notes on back as necessary)	**PA 1**	**PA 2**	**PA 3**
Specific infrastructure improvement(s)			
Property land use improvement			
Property improvement (flood proofing, elevating structures)			
Regional strategies (early flood warning system, land use management)			
Regional projects (floodplain changes and infrastructure design standards)			
Stream flood protection projects (flood wall, levee)			

*Make notes on back of form as necessary

Comments and Questions

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

Contact info:

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