

**KELLY WILLIAMS**  
**WATERSHED SPECIALIST & CAP COORDINATOR**  
**CLEARFIELD COUNTY CONSERVATION DISTRICT**

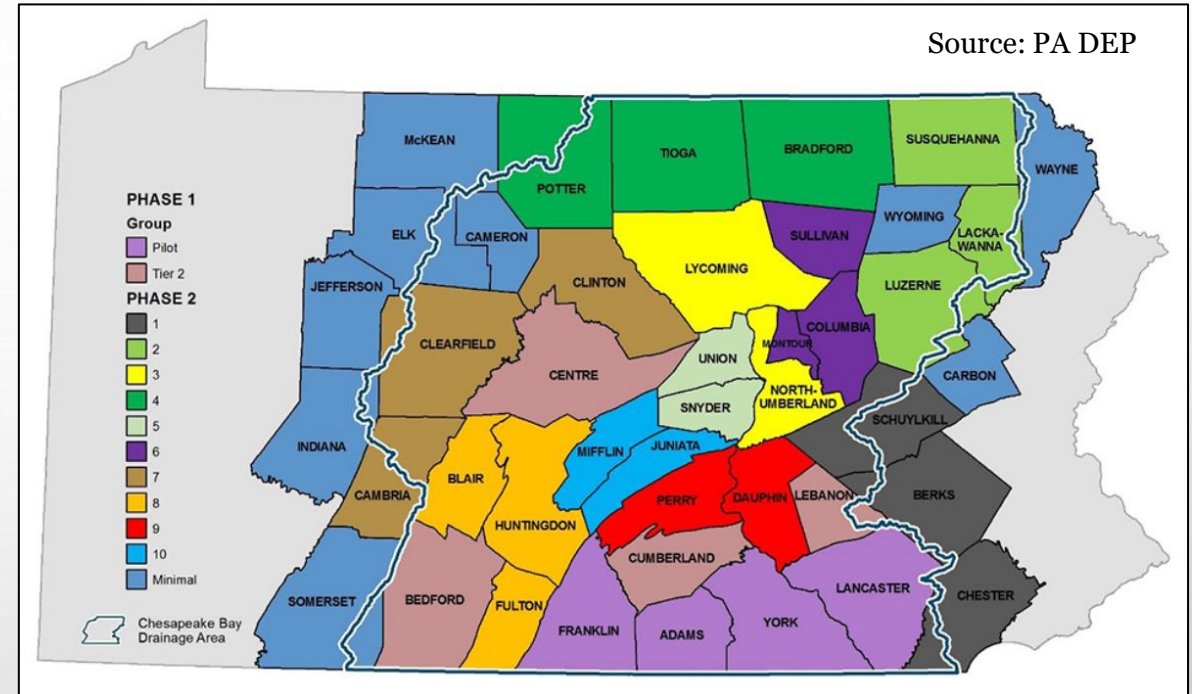
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**ASSOCIATE ENVIRONMENTAL PRACTICE MANAGER,**  
**LARSON DESIGN GROUP**  
**POTTER COUNTY CAP COORDINATOR**

# WHAT IS A CONSERVATION DISTRICT?

- Every county in Pennsylvania except for Philadelphia has a Conservation District = 66 Districts
- Conservation Districts provide locally led conservation efforts throughout Pennsylvania
- Administration of several delegated programs:
  - **Chapter 102: E&S, NPDES reviews**
  - **Chapter 105: general permits associated with in-stream work**
  - **Dirt, Gravel, & Low Volume Road Program**
  - Chesapeake Bay Technician
  - Nutrient Management Technician
  - **Countywide Action Plan Coordination**
  - Agriculture Conservation Assistance Program
  - **Watershed Specialist Program**

# COUNTYWISE ACTION PLANS

- County level planning & prioritization for implementation of Pennsylvania's Phase 3 Watershed Implementation Plan (Phase 3 WIP).
- 43 PA counties are in the Chesapeake Bay Watershed
- 34 of those have Countywide Action Plans and CAP Coordinators who developed and oversee these plans



# CLEARFIELD'S CAP PLAN

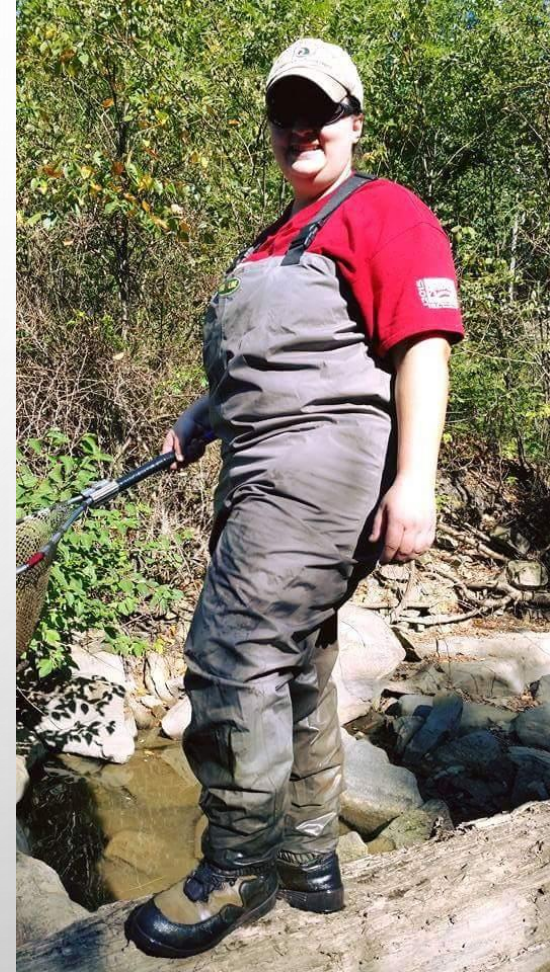
- 55 pages long, 98 priority initiatives
- Agriculture
- Stormwater
- Stream Restorations
- Land Protection
- Wetland Creation and Protection
- Aquatic Organism Passage Improvements
- Floodplain Reconnection
- DGLVR support
- Education
- AMD and AML Remediation

Phase 3 Watershed Implementation Plan (WIP) Annual Progress Update and Two-Year Milestones Report – Clearfield County												
Green - action has been completed or is moving forward as planned    Yellow - action has encountered minor obstacles    Red - action has not been taken or has encountered a serious barrier    Highlight changes for 2024-2025 milestone period												
Action #  Green Yellow Red	Description	Performance Target(s)	Responsible Party(ies) and Partnerships	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Resources Available		Resources Needed		Annual Progress to Date (2021 + 2022 + 2023) *add new 2023 progress above the existing 2021 and 2022 progress. Date each entry	Reason for Change to Action Item (2024-2025 milestone period)
							Technical	Financial	Technical	Financial		
Priority Initiative 1:												
1.0	Implement County Farmland Preservation Program with farmland preservation program incentives enhancement	Increase the financial and technical capabilities of the County Farmland Preservation Program  Other Preservation Grants applied for 50-100 acre/year goal	Conservation District, Clearfield County Commissioners , County Planning, Farmland Preservation Board	Bay Portion of Clearfield County	2021 -2025+	County budget restrictions inhibit additional funding for Farmland Preservation Program. Continue to pursue budget funding/ other grants	Tech assistance and administration- Farmland Preservation Board, County Planning, Conservation District	\$3000- Clean and Green Penalties	Additional Staff Person in County Planning to handle workload	\$100,000/year for additional staff  \$10,000+ for Easement purchase and closure costs	2023- Have our 1 <sup>st</sup> applicant, appraisal completed and accepted, need to do property survey next 2022 – Clearfield County Commissioners signed and approved the allocation of \$5,000 toward the purchase of an easement, Clearfield CCD verbally agreed to match county contributed funds – no applications have been received yet.	
1.1	Chesapeake Bay Technical Inspection/ Plan Data Gathering	Continue implementing Chesapeake Bay Technician contract to provide 38 farm compliance inspections per year, and report additional BMPs	Conservation District	Bay Portion of Clearfield County	2021 – 2025+	Challenge: Time constraints to complete additional BMP reporting under current contract. Recommendation: Increased funding for additional workload and mileage to report and reverify BMPs. Staff turnover	Tech assistance and planning – 1 Chesapeake Bay Technician with ¾ funding	\$72,150 County/ State	Additional Staff Person to handle BMP reporting/tracking/reverification. Staff (see 3.0)	\$72,150	2023- Due to staff turnover a large portion of the year was spent training new Ag Tech while continuing to do inspections, identifying existing BMPs, finding opportunity for new BMP installation, and reporting in PK 2022 – Clearfield CCD Technicians have increased the amount of BMP identified during CBB and Act 38 inspections and reported into PracticeKeeper	



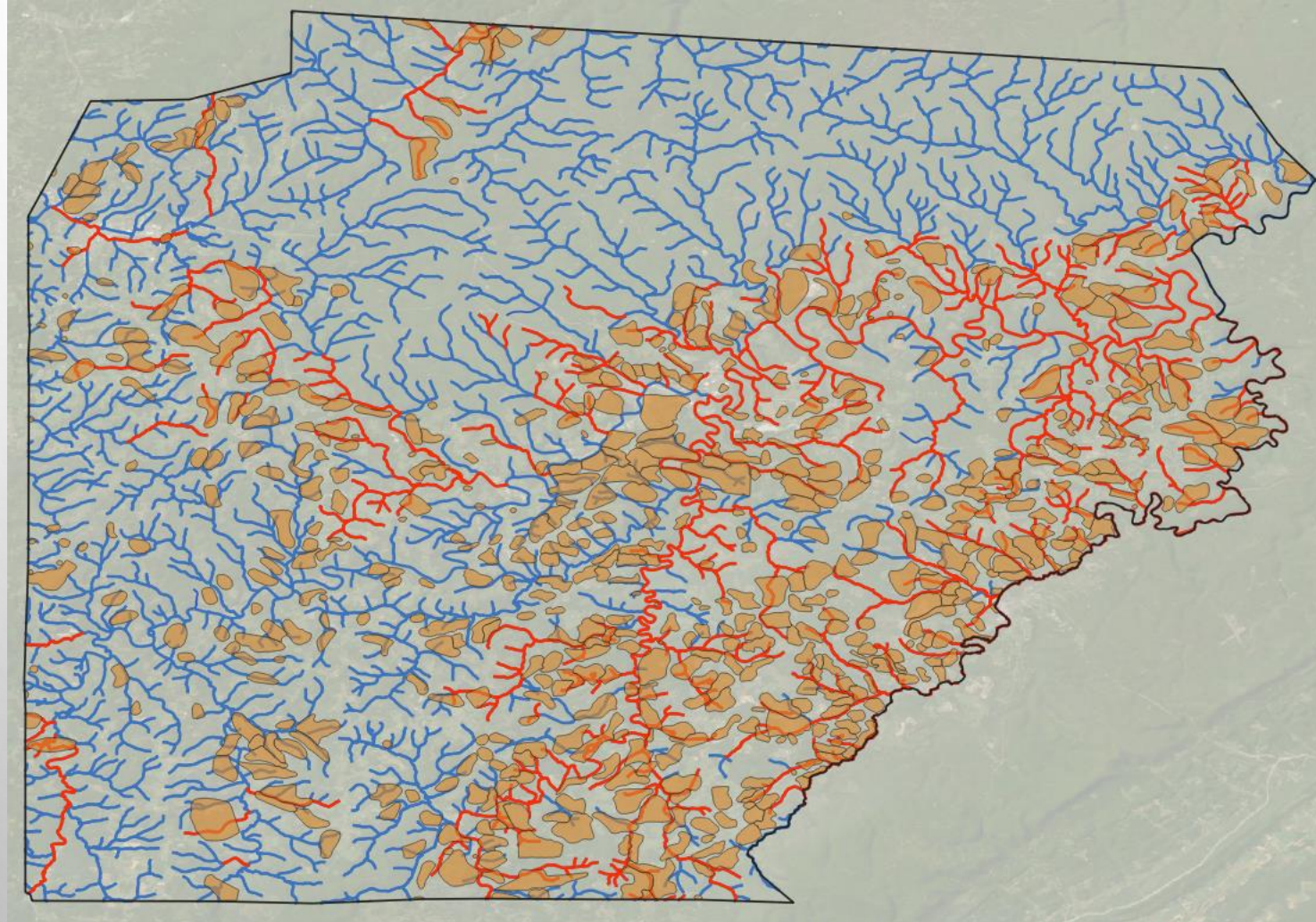
# WATERSHED SPECIALIST POSITION

- Anything related to protecting and improving the water quality of Clearfield County
  - Grant writing and management
  - Project and construction oversight
  - Water quality sampling
  - Fisheries sampling
  - Macroinvertebrate sampling
  - Restoration Plan and Watershed Implementation Plan Development and ongoing management
- Stream Restorations, Agricultural BMP implementation but most importantly.....



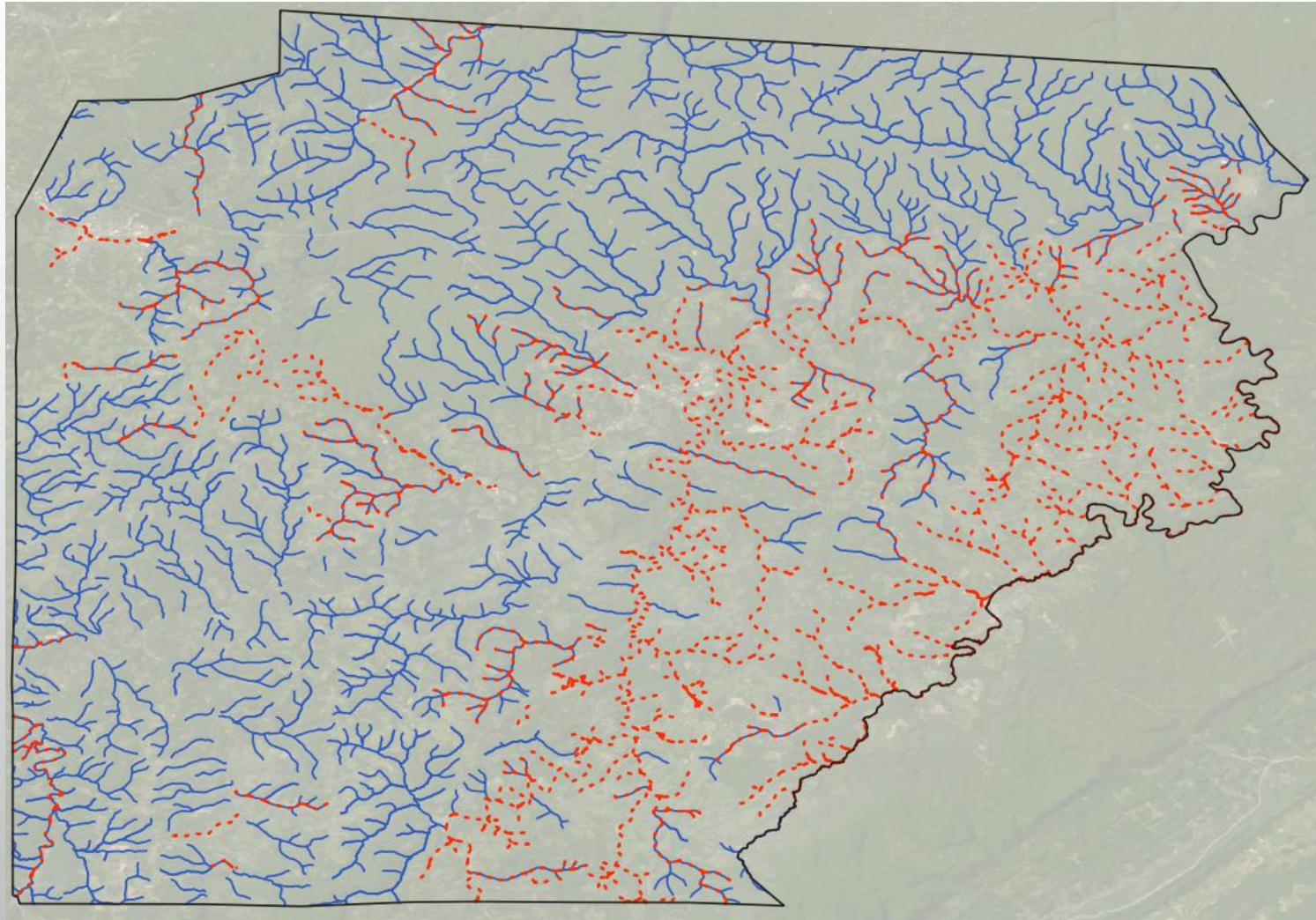


# ABANDONED MINE DRAINAGE TREATMENT & ABANDONED MINE LAND RECLAMATION





# AMD IMPAIRMENT VS NATURAL TROUT REPRODUCTION





# AMD REMEDIATION SUCCESS





# NATURALLY REPRODUCING TROUT RETURN



# EXISTING STUDIES

## Nutrient Reductions as Co-Benefit of Acid Mine Drainage (AMD) Treatment: Quantifying Nutrient Load Reductions for Restored Stream Segments in AMD-impacted Watersheds

Benjamin Hayes<sup>1</sup>, Weixing Zhu<sup>2</sup>, R. John Dawes<sup>3</sup>, Charles A. Cravotta<sup>4</sup>, Robert Hughes<sup>5</sup>, Gregory Moyer<sup>6</sup>, Travis Tasker<sup>7</sup>, James Shallenberger<sup>8</sup>, Michael A. Hewitt<sup>9</sup> and John Dawes<sup>10</sup>

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Short Communication

## Legacy sediment as a potential source of orthophosphate: Preliminary conceptual and geochemical models for the Susquehanna River, Chesapeake Bay watershed, USA

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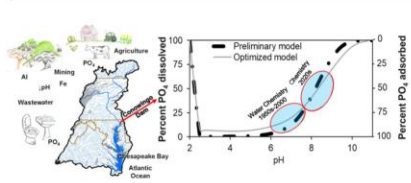
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<sup>h</sup> U.S. Geological Survey, Pennsylvania Water Science Center, Bridgeville, PA, United States of America

### HIGHLIGHTS

- Phosphorus load from the Susquehanna River to the Chesapeake Bay has not decreased.
- Legacy sediment in the Susquehanna River is a tenable source of bioavailable phosphate.
- Since the 1950s, baseline pH of the Susquehanna River has increased from ~6.5 to ~8.
- A geochemical model explains the effect of pH on phosphate attenuation/mobilization.
- At alkaline pH, phosphate may be desorbed from river sediment to the water column.

### GRAPHICAL ABSTRACT



### ARTICLE INFO

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Adsorption  
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### ABSTRACT

Nutrient pollution from agriculture and urban areas plus acid mine drainage (AMD) from legacy coal mines are primary causes of water quality impairment in the Susquehanna River, which is the predominant source of freshwater and nutrients entering the Chesapeake Bay. Recent increases in the delivery of dissolved orthophosphate (PO<sub>4</sub>) from the river to the bay may be linked to long-term increases in pH, decreased acidity of precipitation, and decreased acidity, iron, and aluminum loading from widespread AMD. Since the 1950s, baseline pH increased from ~6.5 to ~8 in the West Branch and "North Branch" of the Susquehanna River, which drain bituminous and anthracite coalfields of Pennsylvania. A current baseline pH of ~8 and daily maxima exceeding 9 have been documented along the lower Susquehanna River. In response to improved river quality, bioavailable PO<sub>4</sub> now may be released into solution from legacy sediment that has filled major impoundments in

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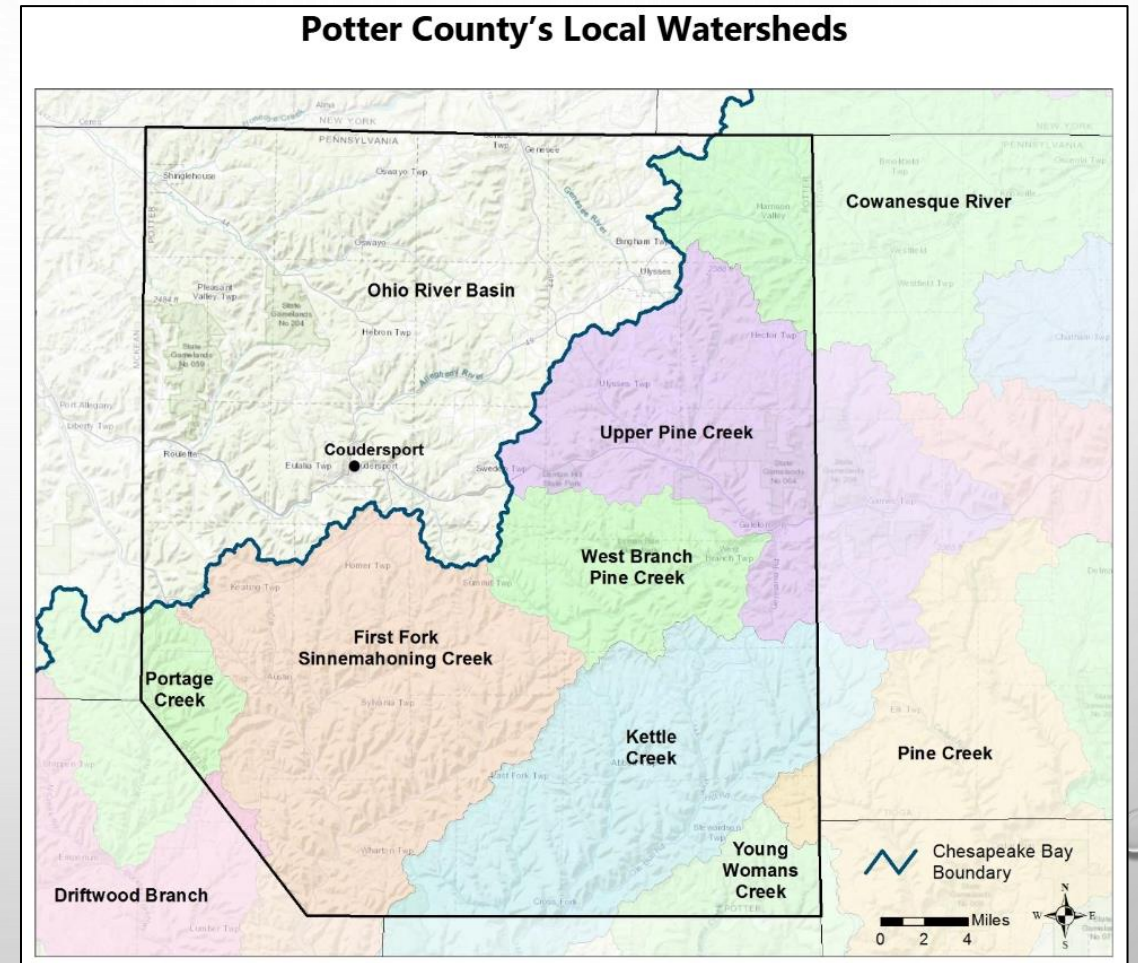
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# POTTER COUNTY CAP PLANNING FOR TROUT

- Instream Habitat Projects
- Trout Hatchery Nutrient Reductions
- Support Fishing Opportunities
- Protect and Restore Watersheds
- Aquatic Organism Passages



# CAPS AND BROOK TROUT

- CAPs vary based on the county and local initiatives
- Rural vs Urban
- Ongoing issues (ie flooding, agricultural impacts, AMD, stormwater, new development types)
- CAPs focus on Water Quality
- Brook Trout of secondary benefactors